NATURE MAGAZINE

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THERE is a tremendous amount of human interest in the picture reproduced on this page. There is also a great deal of significance. On the surface one might merely say that it is a picture of the Bancroft Bird Lovers Club of the Bancroft School, Lincoln, Nebraska; that it was sent in by the inspiration and presiding genius of the Club, Miss E. Ruth Pyrtle; and that it is very nice that the youngsters have made these bird houses.

That is on the surface; but the real significance lies in what this means to the youngsters and to their generation. These school children have made a home for a bird, that is their certificate of membership. More than that, they have, by so doing, established an entente with the feathered world. They will protect and study and befriend citizens of this world because they have built an edifice, however crude or simple, in which they hope a bird will find sanctuary.

The history of destruction of our bird life is a sad one with various black pages. People didn't know. But the members of the Bancroft Bird Lovers Club will know. It is a part of them. And this picture is printed at this time because schools are now opening, and an activity for the winter is just such a thing as this, to the end that in the spring new homes for new birds may be erected. Let there be more such clubs.

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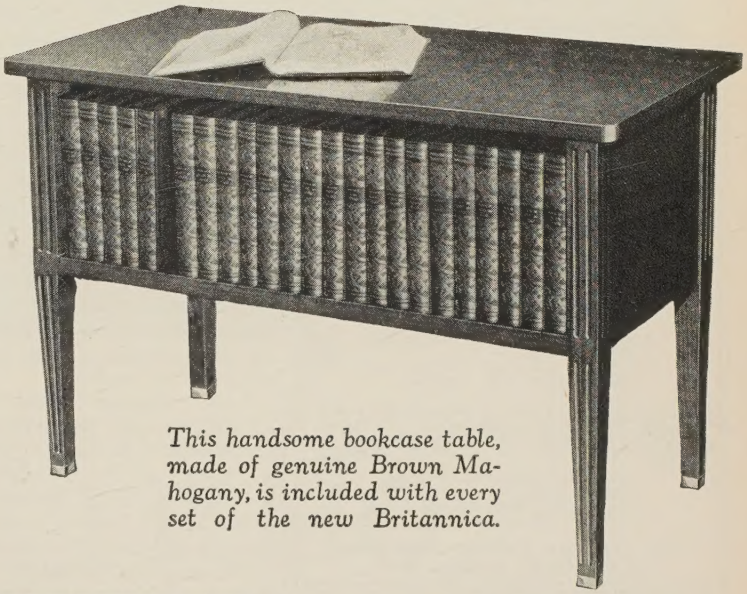

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ANIMAL FLASHLIGHTS

By JAMES D. NELLIS

EVERY one has seen pictures of wild animals that were obviously taken at night by means of a flashlight. To most of us, who are interested in photography, has come the question, "How were those pictures secured?" Of course many pictures of this sort have been taken from a blind in which the photographer lay hidden and operated his camera and flashgun. Flashlight photographs of deer and aquatic animals have been secured from a canoe which was allowed to drift silently upwind, toward the subject. However, many of the flashlight pictures of wild animals were exposed by the animal itself. While doubtless there are devices on the market for securing such pictures, I have never seen one advertised or described.

A short time ago I found a need for such a machine to get some pictures for one of my courses in Zoology. After spending one of those nights in which one woos Morpheus in vain, I thought out a simple device by which I might secure some pictures of wild animals by flashlight at night.

The materials needed for the construction of this device are: some ½" lumber (box boards will do); a sheet of galvanized iron; a sheet of asbestos shingle; three brass bolts, two of them 3" long and one 1" long; some brass or copper rod 18" will be enough; a brass staple; five brass nuts; two hinges; some insulated wire; a Ford spark coil; and a Hot Shot battery.

The flash box (see drawing) is merely a square box 12 x 12 x 6 inches, with a hinged cover (H). A sheet of galvanized iron (A) is bent to the proper curve and is attached to the inside of the box, as shown, at the front of the top and the back of the bottom. A sheet of hard asbestos (C), 6 x 9 inches, is cut and two holes are bored through the center of it and 6" apart; holes to correspond are bored

(Continued on page 261)

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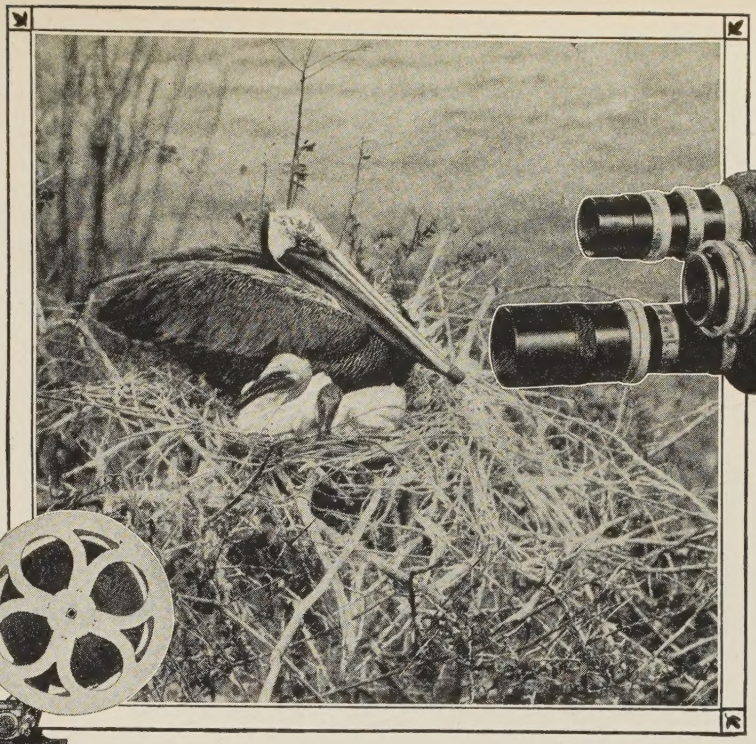

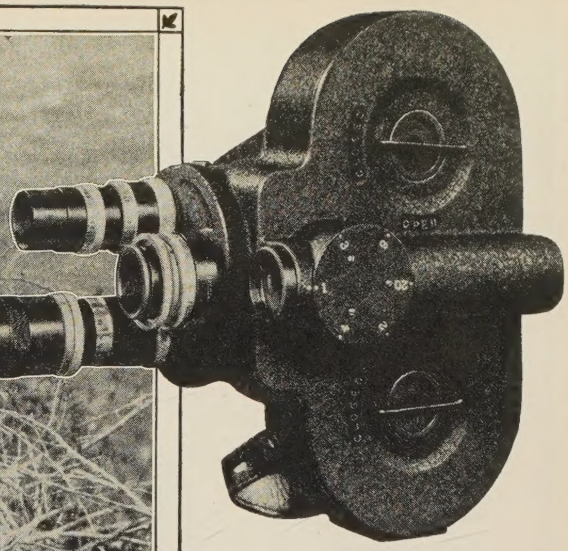

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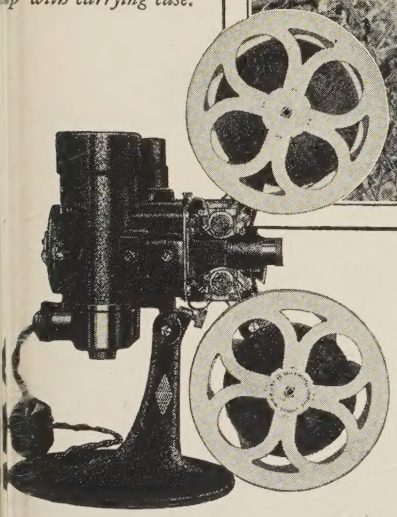

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THE Nature idea in Christmas cards has been so well accepted by readers of Nature Magazine that over 200,000 cards were purchased by them last year.

R. Bruce Horsfall, noted Nature artist, is now doing six nature paintings for use on cards this season. The cards will be reproduced from these six Nature subjects in four water colors and one steel die engraving, and on different colors of greeting card stock. Each package will be made up of 24 greeting cards, comprising six different subjects on four different colors of stock, making them all different for practical use. There will be twelve 4 x 5 flat cards and twelve 4 x 5 folded cards, with envelopes to match.

The cards will be similar in quality to those that retail for ten cents each, but owing to the large quantity to be purchased they will be sold to readers of Nature Magazine for only $1.00 per box, postpaid.

Many inquiries from satisfied purchasers of last year's greeting cards have prompted us to make this announcement.

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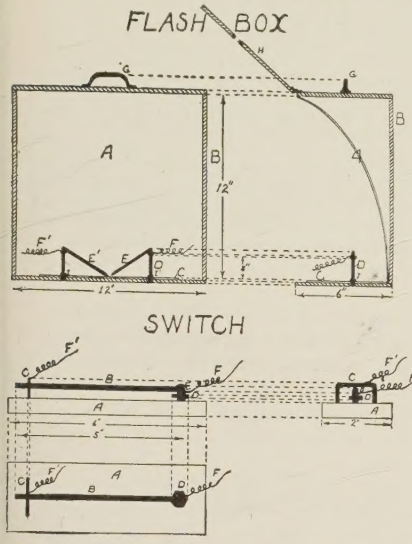
1214 Sixteenth St., N. W. THE AMERICAN NATURE ASSOCIATION Washington, D. C.

through the center of the bottom of the box. Two brass bolts are inserted in these holes and secured by a brass nut (I). To the top of each bolt is soldered a length of brass or copper rod (E) of proper length and at such an angle that the tips of these rods will touch the asbestos sheet and will clear each other by ¼". Before soldering is done, a brass nut is turned on the rod and is used to tighten up on the wire (F).



The wires (F) and (F') are hooked up with a Ford spark coil and a Hot Shot battery so that when the switch is closed a spark will jump from (E) to (E'), thus igniting the flash powder which is spread upon the sheet of asbestos (C) and piled in the gap between (E) and (E').

The switch consists of a wooden base (A) which is 6 x 2 x ½ inches; inserted in this block at one end is a brass bolt (E) 1 inch long on which is screwed a brass nut (D) which is tightened up on the wire (F). To the top of the brass bolt (E) is soldered a rod of brass or copper (B) which is 5 inches long, the tip of which extends under a brass staple (C) which is driven into the wood near the end of the base opposite to the one containing the bolt (E). The wire (F') is soldered to the top of this staple.

To operate this machine the camera is set up on a tripod and focused on a certain spot on the trail of the animal that it is intended to photograph. The flash box is set up slightly behind the camera and to one side. In the flash box is the required amount of flash powder so arranged that the spark will ignite it. The battery and coil are hooked up and the switch is fastened to a tree or stake on the side toward the trail, with the base against the tree or stake. The switch is hooked up in the circuit and a strong string such as fish-line is attached to the end of the switch bar (B) opposite to the end (E). The other end of the string is carried across the trail and fastened to some stationary object, such as a tree, at a proper elevation so that the animal in traversing the trail will run into the string, thus pulling the bar (B) against the staple (C) and causing the flashlight powder to be burned.

There is only one drawback to this device, and that is that the lens of your camera has to be set on time and opened after dark, also closed before daylight. However to one who is truly interested in getting portraits of wild animals, this inconvenience is well repaid by a successful picture.

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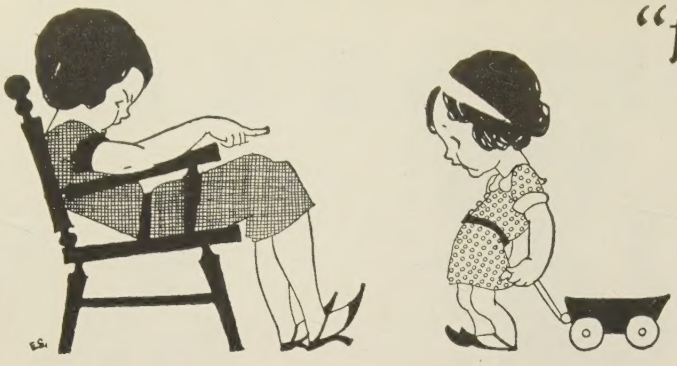

"for heaven's sake— STAND UP STRAIGHT!"

"FOR CENTURIES, irritated parents, tired from the day's work, or quailing at the prospect of it, have been lying back in their favorite chairs and snarling at their offspring for heaven's sake to stand up straight"—writes Armitage Whitman, M.D. in "Proper Posture", an article appearing in November HYGEIA. He goes on to ask—

"How may we transform a round shouldered, pot bellied, hollow backed, knock kneed, flat footed child, into a self respecting physical and mental specimen that we can regard not only without a shudder but perhaps even with some degree of pleasure?"

Dr. Whitman reveals a rare sense of humor and a delightful style in "Proper Posture". He entertains you while laying down definite, concrete ways for obtaining and maintaining correct posture. "Proper Posture" is a valuable treat for all the family. Don't miss it!

November HYGEIA Brings These Features Too—

Diseases of Some Famous Characters of History—

Caesar died a violent death in the chamber of the Roman Senate—Napoleon died from cancer of the stomach. But is there any proof that these two famous characters of history were epileptics? Contrary to general belief, George Washington did NOT die from **diphtheria.** What was his fatal illness? James O. Nall, M. D., answers these questions and gives other reliable information on "Diseases of Some of Our Famous Characters of History" in November HYGEIA.

The Control of Pernicious Anemia—

The germ of the idea of liver feeding in anemia dates back just one decade. From over the butcher's counter came the public's first inkling of the use of liver in treating that insidious disease—pernicious anemia. In "The Control of Pernicious Anemia", Julian W. Brandeis, analyzes this dread malady and discusses the recent successful advances to combat it.

The Sanity of the Criminal—

By an understanding of the individual offender, crimes are punished more suitably and society is furnished with the maximum degree of protection. Enter the psychiatrist—the specialist in mental disorders who is performing a valuable service in criminal courts. Winfred Overholser, M. D., psychiatrist in the Massachusetts courts, writes interestingly on a vital subject, "The Sanity of the Criminal".

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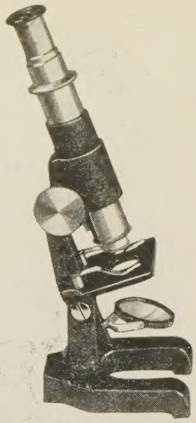

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High Adventure

To us more romantic and engrossing than most fiction are well told stories of true adventure into lands shrouded with the mysterious veil of incomplete knowledge. Such a book is *Across Asia's Snows and Deserts* by William J. Morden. It is the story of the Marco Polo trail from Bombay to Peking, but more than that it is a tale of high courage and endurance as well as achievement. Mr. Morden had for some time cherished the theory that the supposedly rare *Ovis poli* was not as rare as generally believed. His conviction was that those animals heretofore taken were found on one side of the mountains to which a few had migrated, while on the other side they were to be found in numbers. His theory was not shared by others, so with James L. Clark of the American Museum of Natural History, he started out on the Morden-Clark Expedition to justify his belief. He succeeded and found this majestic horned mammal of the upper heights in herds. But the story he tells is that of the crossing of the mountain passes and desert wastes, of narrow escapes from death and torture at the hands of the Mongols. The story is told with simplicity and skill. It is the sort of book one is loath to lay down. The publishers are G. P. Putnam's Sons, New York. R. W. W.

Clubs in the Schools

An extra-curricular activity of the schools which has attained considerable significance and is steadily growing is found in the school clubs dedicated to one or another specialized activity. Properly directed, as in the majority of cases they are, the school club is a distinctly valuable adjunct to the school and of notable value to the student. Such a situation existing, *School Clubs* by Harry C. McKown is a most useful volume. It has recently come from the presses of the Macmillan Company and is devoted to the organization, administration, supervision and activities of these clubs. Nature Clubs, of course, are included in the discussion. This is a book which should be in the private library of every school superintendent for his or her use and subject to the needs of the teachers.

All who have seen the Finley pictures in the past will agree that these pictures are the best yet.

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You who have read the story of the expedition, appearing in Nature Magazine during 1928 and again in the recent 1929 issues, will be more than ever eager to see these pictures and hear Mr. Finley. Rocky Mountain Goats—outwitted by the use of a goat disguise, photographed within 50 feet. Moose—that threatened the cameraman, and at one time came too close for his comfort. Beaver—photographed in the wild, cutting branches and building a dam. Bighorn Sheep—high up on the mountain passes. Pronghorn Antelope—photographed from a pursuing automobile travelling at 45 miles an hour. Herd of Elk—fording a river. Bears—raiding the camp. Conies, deer, marmots, ptarmigan, jays, Franklin grouse or fool-hens, and other birds of the high peaks.

Dates for the coming season should be arranged as soon as possible by addressing

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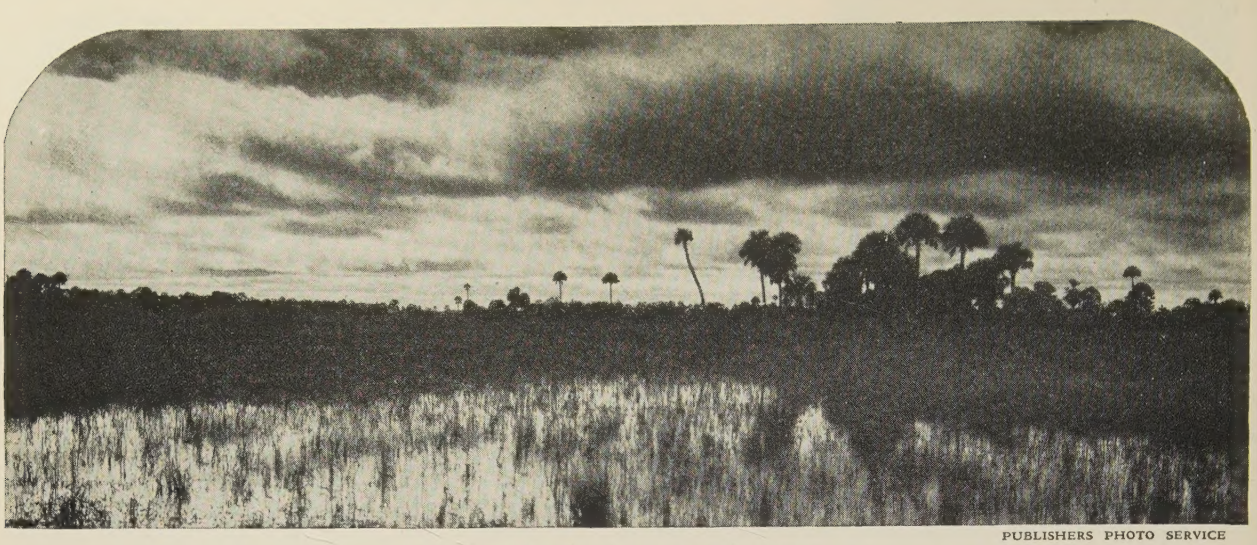

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IN THE EVERGLADES OF FLORIDA

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PUBLISHED BY

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To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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November, 1929

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NATURE CALENDAR

NOVEMBER

by E. Laurence Palmer

To many, November is a month of sports. Football championships are decided to a considerable extent. Sportsmen interested in the killing of game take to the field in great numbers and many people not identified as sportsmen get real pleasure from life out of doors in this month. It is rather difficult for one to decide whether or not he wishes to be classified as a sport when an examination of the definitions of sports, sporting and sportsmen is made.

One definition classifies those who are flashy, cheap and gamblers as sports. Some of these are always present as a minority at the usual college football game. With them might possibly be associated the hunters who go to the fields and woods for the purpose of carousal. They are frequently those who bring home big bags because they give the game no chance. They shoot into rafts of ducks killing a few, wounding many and frightening all the rest. They are even traitors to those who hunt since by their practices they ruin the hunting for those who follow them. It is they who oppose the establishment of sanctuaries and use every device possible to defeat the purpose of conservation either by violating the laws or keeping just within the law. Fortunately, this type of sport is ordinarily in the minority and to an apparently increasing extent is losing influence.

Another definition of a sport fits many of those who are much in evidence in November. It defines a sport as one who is always fair and generous, one who has recourse to nothing illegitimate, who is both a good loser and winner. The writer likes to believe that a great majority of those of influence in conservation matters were recruited from sports of this type. Certainly, some of the greatest lovers of birds spent their youth as collectors of birds' eggs and learned much of the habits of game creatures through hunting them with a gun. As information and experience came to these people, they recognized and formulated rules of ethics which gave their prey a chance. As cameras became popular, they found that perfectly acceptable trophies of their prowess could be brought home for their own satisfaction and for the satisfaction of their friends. They found that these changed means of hunting left opportunities for others to share their pleasures and in this they were generous and fair. Laws were not necessary to curb their activities and so they never arose as an issue except to protest against the selfish acts of others. These people have led in the establishment of refuges and sanctuaries, in reforestation projects and in education of the public concerning satisfaction which may be secured from Nature.

Intermediate between these groups are the sportsmen who have lacked the opportunity to study Nature with some leisure. It takes too much time and patience for them to use a camera when a bullet will prove that they have seen game. These individuals spend great sums for the propagation of game which they may turn loose to kill. Frequently they have the means to establish private shooting grounds where they encourage game to seek shelter at some times of year so that they may be killed in numbers at other times. It does not seem that these sportsmen, who are very numerous, can justly be classified under the second definition given in this article. The writer believes that the majority of them can be educated to see things in a different light since most of them are right at heart.

It may be significant that I have been able to find no definition of sportsman that includes the user of a steel trap specifically. Sometime the wearers of furs may become sufficiently good sports to make it unprofitable for trappers to cause as much misery in November as is at present the case.

A few years ago splendid Nature photographs began to appear in print. Surely the future holds ample opportunity for the better kind of sportsman to get pleasure from Nature for himself and for his friends through this satisfactory means.

THE ETERNAL RAINBOW—RAINBOW BRIDGE- GOD OF THE NAVAJOS

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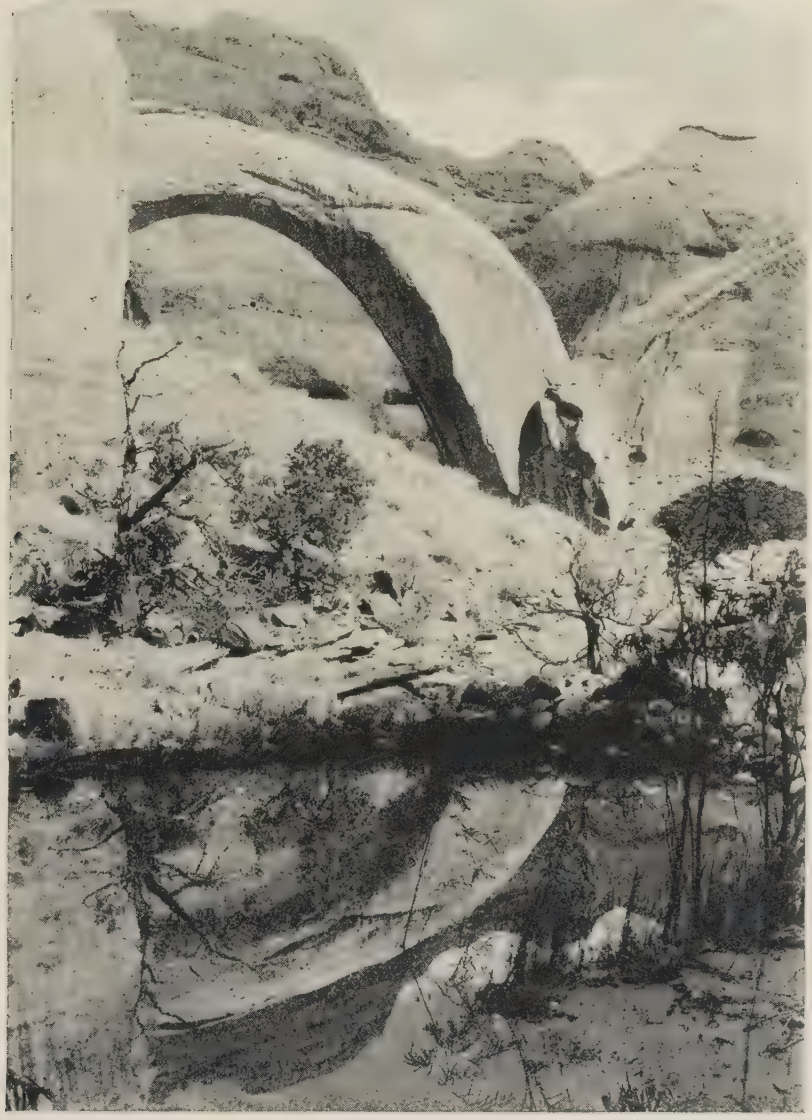


A RARE PICTURE
A reflection like this of the eternal rainbow is an unusual view of the wonderful bridge

AFTER A RAIN
Water gathered in a little pool which the Navajo Indians have made for their flocks

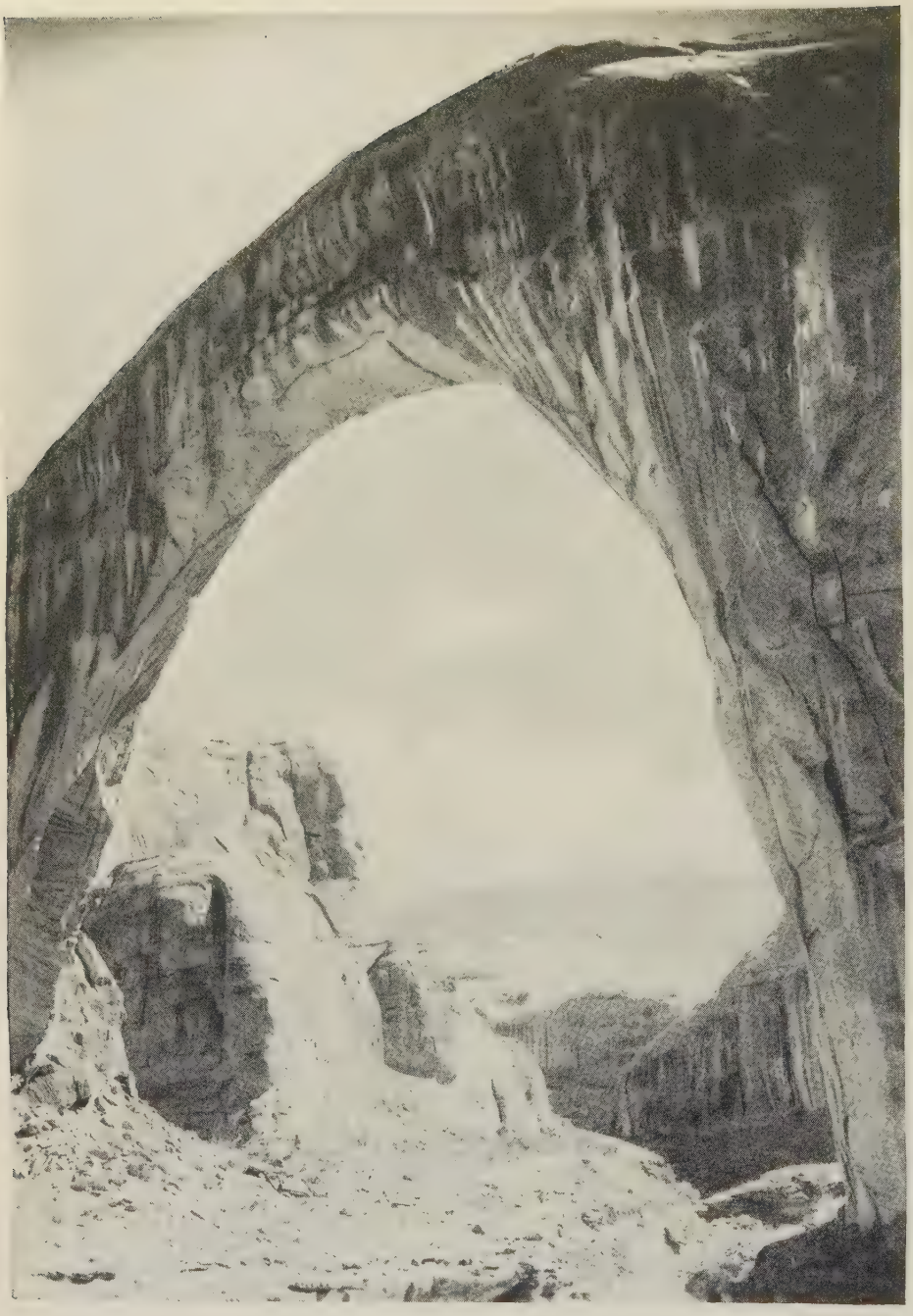
THE ETERNAL RAINBOW

by Hugh Stevens Bell

Photographs by the author

A few hundred yards south of the Arizona-Utah line, well up on the shoulder of Navajo Mountain, is a little inn and trading post called Rainbow Lodge. From it an excellent trail leads to the summit of isolated Navajo Mountain from which point of vantage one can drink in the most remarkable panorama in the entire Southwest, as he turns about to survey 115,000 square miles of perhaps the wildest part of our nation.

To the east lies unbelievable Monument Valley, and to the north a vast *terra incognita* drained by the San Juan, Grand and Green Rivers which unite their waters to form the mighty Colorado. Northwest, and seemingly almost beneath one's feet, tucked away in a huge canyon of reddish sandstone, is a great god of the Navajos, Rainbow Natural Bridge—the eternal rainbow. Seventy miles beyond,—a great pink gash on the side of a



AS THOUGH BENEATH THE NECK OF A MONSTROUS GIRAFFE

Notice the streaking on the arch, shown particularly well in the picture from this angle

mountain,—is Bryce Canyon, one of the most famous and colorful spots in the Southwest. Less than one hundred miles west-southwest is the great green Kaibab Plateau and the mile deep gorge of the Grand Canyon. Southward the Painted Desert sprawls about beyond White Mesa.

At Rainbow Lodge one September afternoon Bob, Fran and I shouldered our packs and followed a trail northwest until, at last, we came to Rainbow Bridge, greatest and most beautiful of all the known natural bridges in the world. We set out planning to return the following day, reckoning not upon a drink at a pool of clear, cool, sparkling but poisonous water.

It is only eleven miles from the lodge to the bridge, and the trail is ordinarily in good condition, although it is one of the most arduous in America, resembling nothing so much as a graph of business conditions in a fickle year. Anyone who is not a trained hiker and in excellent condition will do wisely to go down to the bridge on the hurricane deck of a saddle mule, and enjoy life at the ideal little camp which the lodge maintains in Bridge Canyon.

We had just begun to perspire beneath our packs when the trail nosed its way over a canyon wall and writhed downward to the floor some four hundred feet below, crossed to the opposite wall and twisted its way to the rim once more. There we stopped to "blow" for a minute and look back at our route. Twenty minutes of agonized walking had gotten us only across the canyon, and we could practically throw a stone from one rim to the other.

Three minutes later the trail tumbled into another and deeper canyon and we could see it wriggling its way up the opposite cliff like a colicky snake. On the far rim we stopped for breath again, and Bob orated on the advantages of suspension bridges. A mile farther along we found the third canyon, descended into it, crossed its floor and began an ascent of nearly four thousand feet to a little pass high on the shoulder of Navajo Mountain.

Again we rested and this time had a superb view of all the Rainbow country. Bridge Canyon, Boulder Canyon and Forbidden Canyon wandered away to the north through a multitude of magnificent domes, smoothed and rounded by windblown sand. For the most part it was a scene of dull red sandstone with here and there layers of snowy white, and a hopeful blotch of green where cedar or pinyon fought for a footing. Beyond the Colorado was the conspicuous flat summit of Fifty Mile Mountain, on our left the long straight line of No Name Mesa, and on our right, just hidden from view, the country of the Standing Rocks, and Surprise Valley. Straight ahead, and below

ATOP THE ARCH OF THE ETERNAL RAINBOW—AND HOW!

The author is undoubtedly the first to be pictured standing on his head thus

us, concealed somewhere in that tumbled jungle of domes, was Rainbow Bridge, a glimpse of which was to be the reward for our labors.

As yet we had found no water, but as we shouldered our burdens again I pointed into the canyon more than four thousand feet below us and assured the boys that "first water" was waiting for us there.

"Gosh, that's great!" Bob exclaimed, as we stood there sweltering in the afternoon sun. "I could see my breath the last thousand feet up the other side."

"Bob, you eternal liar!" I reprimanded as I wondered how much more than 100° F. it had been on that slope.

"No kiddin'," he rejoined. "I was blowing out dust at an awful rate."

Down we went to jump along the boulder-strewn canyon floor where I drank not wisely but too well from a sparkling, refreshing pool of poison.

Around the next bend we heard the noise of rolling stones, and then came Clair Haight, a smile spread across one of the finest faces west of the Mississippi.

"Howdy, boys," he said.

"Why the cannon?" Fran asked, as he eyed Clair's sixshooter.

"Never know what you might run onto on these trails. Bear tracks down the canyon yesterday. How you makin' it?"

We assured him that everything was going to our liking, gave him messages for our friends at the lodge, and continued down the stream until I sighted the beautiful cathedral arch which hangs on the wall of Boulder Canyon at the point where the trail turns abruptly right to traverse Redbud Pass for a mile and a quarter and emerge into Bridge Canyon about three miles above the Rainbow.

The first half mile in Redbud is the worst of the entire trail, I believe. Except early in the morning or late in the evening the heat is ample, the sand is always deep and the trail climbs steadily and sharply until the divide is reached. But so soon as the divide is passed there is nothing but easy trail ahead and after the first three-quarters of a mile there is always good water in abundance.

Shadows were climbing rapidly to the top of the canyon wall when I climbed a little knoll and called the boys for their first sight of the great arch. Then the deep canyon echoed with our shouts, and we turned right into a nice rinconne to seek out a cave where we might spend the night. I was sick, and knew it, although I had not dared mention the fact to the boys.

At last we found a suitable cave and staggered into it. I was very glad because "April showers" have formed a habit of arriving about four months late around

Navajo Mountain, and I had a decided premonition that the spot where I placed my bed would need to be dry for a week or more. The next day the showers came and a waterfall fifty feet wide and more than one hundred feet high hung like a red curtain across the mouth of our cave. Into our rincon a dozen others roared and tumbled as they cascaded from the rounded domes about us.

A few feet away was a cache of bedding sufficient for a dozen, and food enough to last us for a month or more. Our cave was a beauty, fit for a cliff dwelling, and in springtime the home of many seepy places where pure white columbine and dainty maidenhair fern lived happily together. Fifty men could have found bed space there, so we deemed ourselves twice blessed.

Four days and nights passed and still I was too sick to think of moving. Rainbow Lodge, the nearest habitation, was eleven miles away. The nearest doctor was one hundred miles from there, and the nearest telephone across the street from his house in Tuba City. All in all, it was a pretty mess.

And then Clair Haight came into camp a few hours later to announce his intention to stay a while and feed us until we looked a little less "like stock on a desert range in a poor season". After eating Clair's food for four days and listen-

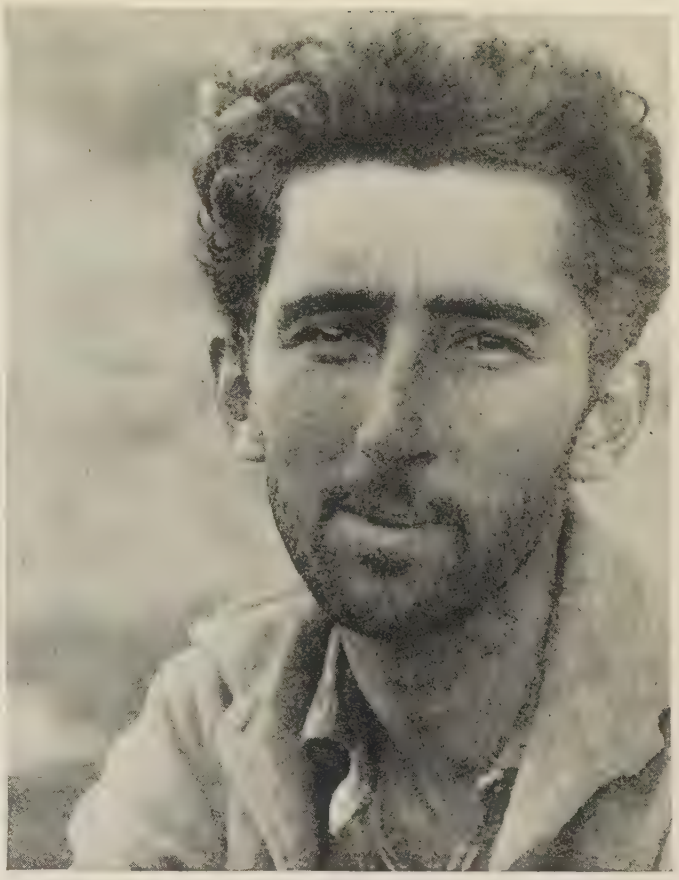
CLAIR HAIGHT, SOLE OWNER OF ONE OF THE FINEST FACES IN THE SOUTHWEST

(Below) Looking toward the Navajo Mountains and showing the water streaks on the cliff beneath the arch. The cliff is a quarter mile away

ing to his yarns for as many nights I went on wabbly legs for a look at that magnificent arch which has been for centuries a god of the Navajos. With a height of 309 feet and a span of 278 feet, carved from massive red sandstones, curved as gracefully as the arch of a cathedral window, rounded and smoothed by the ravages of wind, sand, sun and water for an eternity which is now lost in the dust of ages, Rainbow Bridge is one of the most awe-inspiring sights in America. In my experience it is surpassed only by Crater Lake, Oregon, and for me it surpasses the wonders of Carlsbad and the magnificence of the biggest sequoias.

There can be little doubt that the view of it from downstream surpasses all others, for then the graceful red arch, streaked, blotched and mottled with purple-brown, forms a frame for the gigantic white bulk of Navajo Mountain with its dark green forests. This, against a turquoise sky in which fleets of thunderheads float aimlessly, prints a picture on one's mind that only death destroys.

The "worm's-eye" view looks, I suppose, very much the same as a giraffe nibbling on low bushes looks to the flea nibbling on his ankle. I have slept beneath the bridge and can testify that at night it seems more than ever to be the neck of some huge monster which is browsing in the



THE AUTHOR, HEAVILY TIMBERED, AFTER HIS SIEGE OF ILLNESS ON THE TRAIL

(Below) The most honest picture of the bridge if not as artistic as some others. One sees the entire span. Note man in the foreground

THE ELEPHANT'S FEET, NEAR RED LAKES, ARIZONA

The automobile road to Navajo Mountain passes between them. His other feet are about fifteen miles away on the northern end of White Mesa

canyon, although the animal fodder would be lean, indeed.

About a quarter of a mile downstream, on the lefthand wall of the canyon, there is a trail,—excellent for cliff dwellers and monkeys,—which will eventually take one to a point adjacent to and about level with the top of the bridge. From here, with ropes, it is possible to reach the bridge and climb to the very peak of the arch. Of course when one is on the bridge it is quite like being on the great wall of China, for there is absolutely no way of telling that 35 feet below is the beginning of 285 feet of air, then about six inches of water, and I know not how much purplish sandstone beneath the water. Only a few dozen of the thousand people who have seen Rainbow Bridge have ever set foot upon it. From experience I know that it takes courage.

The best bird's-eye view of the bridge requires a rather difficult trail trip of nearly a mile from the top of the bridge. This brings one to a point about a quarter of a mile upstream from, and four or five hundred feet higher than, the top of the Rainbow.

If you are interested in its formation, it is from this spot that you can read the story most easily. It is rather obvious that the little stream which has spent a few milleniums cutting the gorge which is now Bridge Canyon ran eventually against a transverse ridge of much harder sandstone through which it could not cut its way as rapidly as it could through the softer surrounding rocks. Therefore it wandered off to the right against the canyon wall, searched for a soft spot, found it, eroded it away, and meandered back on the downstream side of the ridge to its normal channel.

In due time this little detour took the form of an oxbow, with the stream rushing against the hard wall, swirling over against the cliff, following it for a hundred feet or so, and then coming against the downstream side of the resistant barrier with considerable erosive force.

Since the little stream was busy with its downcutting all the while, it was only a matter of time until the natural barrier rose high above the streambed, as if the cliff on the left was sticking its nose into the river's business. Slowly but surely the patient waters gnawed a half-dome-shaped cave in that wall, ran around it and repeated the process on the opposite side. Thus two caves were being excavated simultaneously and each flood made them larger, brought their rounded backs closer together, hastened the time when they would unite.

At length the day came when that ever-thinning partition between them crumbled before the onslaught of flood-tossed boulders, and the little stream which had been forced to detour for a dozen centuries gurgled joyously through that newly-opened doorway, widened it with every floody onslaught, sang a bubbling song of freedom and soon abandoned forever the oxbow channel around that adamantine tyrant. Such was the birth of Rainbow Bridge!

I wish I might have seen the great arch then. There was nothing beautiful about it, and certainly it had none of the grandeur or the grace it has today. I love to think of it in its first Septembers when the storm god burst his bulging clouds upon Navajo Mountain's wooded flanks and sent a flood of raging waters down the narrow canyon. I can see the torrent's crest, white upon the rust red waters, tossing logs like straws before it as it roars into the natural funnel formed by the upper cave and strives with all its awful force to make the outlet larger.

The point of rock mentioned as adjacent to and level with the top of the arch was at one time a part of the original arch which, sometime in the distant past, split longitudinally along a jointplane, eventually allowing a section composed of two-thirds of the ancient bridge to crash into the stream, leaving a telltale abutment on the lefthand cliff. That great crash was the one thing

(Continued on page 310)

JIMMIE PROVES TO BE DISTINCTLY BANANA-CONSCIOUS AND MANAGES TO GET HIS QUOTA OF VITAMINS

BOTH JIMMIE AND ELLEN PARTICULARLY LIKE THE INSIDE OF THE BANANA SKIN AS AN ITEM OF DIET

JIMMIE *and* ELLEN APE

In Which Dr. C. V. Noback Discourses on Ape Babies

By Ruth Crosby Noble

Photographs Courtesy N. Y. Zoological Society

Two little waifs were left on the doorstep of the New York Zoo. The authorities had asserted again and again that young babies should be brought up by their mothers, especially baby apes. But Jimmie and Ellen were more or less thrust upon them and there was nothing to do but adopt the pair. Being a friend of the household, of course I had to call. And it seemed only fitting that my own pair of human "monkeys" should trot along to pay their respects.

We walked informally right into the kitchen of the Zoo Hospital where the new babies were being cared for. Dr. Noback, the veterinarian, was just mixing their formula:—½ can condensed milk, 1 qt. boiling water, 4 tsp. irradiated dried milk (treated with ultra-violet), and 4 tsp. Imperial Granum. Having had endless experience in just this sort of thing, I felt like a slacker standing by and watching him. Yet no mother could have stirred up the ingredients more carefully, or tested their temperature more exactly, than this robust, kindly-faced animal-doctor.

"If it's too cold, they won't touch it. And if it's too hot, you may as well kill them outright. They'll never drink milk again and it's hopeless to rear them without it. You know what problems these babies are."

Then we brought the milk in to the patients,—not in a bottle but in an open pan. As I glanced toward the cage, a vision of two docile baby apes, sitting dreamily arm in arm, was immediately transformed into a comedy of two grotesque jumping-jacks, leaping up and down, reaching madly through the bars, screaming a frantic "Ee—ee—ee—ee!" And then all was quiet except for the "Lap, lap, lap. Sip, sip, sip." The level of the milk lowered steadily and soon the pan was empty.

"We just can't feed them all they'd like," said Dr. Noback. "Their stomachs simply won't hold it and they'd be sure to lose everything." Their tummies,—round and tight as basket-balls,—did look ready to burst.

Milk gone, the animals *outside* the cage and the animals *inside* the cage looked each other over. Jimmie, being a boy and a gorilla, of course commanded much more attention. Few baby gorillas have ever been raised in zoos and none ever born in captivity. Parent gorillas will fight till death to defend their young, so that the capture of a baby usually means a double or triple tragedy of the jungle. That is why few zoological institutions will countenance the traffic in young gorillas.

LEFT TO RIGHT—ELLEN AND JIMMIE
Inseparable babies with most of the childhood traits of human youngsters

"The joke of it is, he was given to us as 'Janet'. When we discovered that 'she' was a 'he', we thought Jimmie would be a good name. Ellen, however, is a genuine Ellen."

Ellen was a chimpanzee, the travelling companion and bosom friend of James, at once as feminine and forbearing as he was masculine and overbearing. Jimmie was black; Ellen was mulatto. Jimmie's nose and ears were flat, while Ellen's nose was slightly tilted and her ears were large and outstanding.

"How many years old are they?" inquired my four-year-old.

"Somewhere between one and two. It's hard to tell exactly, but we can guess from their teeth. At one year, baby apes have a complete set of twenty 'milk teeth', such as human babies have at two. When an ape is two years old, his first teeth are already beginning to fall out. Jimmie and Ellen have their twenty, with none lost as yet.

"They were captured in Africa by two missionaries and brought to New York by Dr. W. Reginald Wheeler, the pair always together throughout the journey. Without companionship, any young ape, especially a gorilla, will pine away from sheer loneliness. When they arrived they were emaciated from their long trip and were suffering from colds and from eczema which was probably due to an unnatural diet. Ten days in the hospital, however, put a whole pound and a half on Jimmie."

"Just from milk?"

"Oh no. Milk at seven in the morning. At nine an orange or a banana. They particularly love the inside of a banana peel, the part which makes our mouths so puckery. One o'clock and three o'clock, milk again. And at five-thirty, milk and eggs. Between meals we sometimes give them a raw carrot or parsley tops. We've just ordered a supply of bamboo sprouts for them. That is their most important native food in Africa,—not bananas as you might think."

"I see you're taking care of the vitamins!" I laughed.

"Vitamins and sunbaths," he agreed. "Even more important for apes than for human babies, for apes are used to living outdoors and in a region where ultra-violet is very strong. We even had them X-rayed the other day and pronounced free from rickets. Come and see their playroom."

We stepped across the hall into a light airy room, quite bare except for a trapeze and numerous illuminating appliances. He turned on one of the large standing lamps. "Ultra-violet," he said. "Every morning right after breakfast we bring the pair in here for a romp in the sunshine. They are always hilarious at that time of day and have a glorious time pummelling each other, chasing round and round the room, wrestling, swinging on the trapeze. Ellen usually gets the worst of it. Jimmie often acts the part of a real bad boy and teases her, just for the sake of the teasing. But if she goes away, he is broken-hearted and will howl and cry, none the less feelingly for lack of tears, for apes never do shed tears.

"I really can't see that they're much different from children," added the doctor. He has three and he ought to know. "They bully each other, fight with each other, and adore each other. Their stomachs are their chief concern, though they will do a lot for affection or attention. Yes, they are surely very human.

JIMMIE IN AN AFFECTIONATE MOOD
Ellen seems quite coy, or perhaps is embarrassed at being photographed thus

For almost a year they are helpless babies but by two they are pretty well able to shift for themselves, certainly far better than a two-year-old human. During childhood they spend most of their time just playing, incidently learning many lessons. About twelve they are quite grown up and like human grown-ups don't care so much about playing. Like some big people, too, they often become very cross. An adult chimpanzee is not nearly as large as a man, but he is about three times as strong. And a full grown gorilla, though seldom taller than six feet, is as heavy as two men and as strong as five. It's only when young that you can teach apes new tricks. After that they stubbornly refuse to learn."

As we went back into the "ward", a strange sound came to our ears and there was Jimmie sucking his toes. It was the first time that phenomenon had ever been observed at the Zoo!

The children had brought some toys to present to their new friends:—a wooden cow, a battered tin train, and a tiny cloth monkey. It must be admitted that the apes showed little intelligent interest in the toys as such. Their first thought was food and Ellen was immensely disgusted to bite into the cow and find it wood, when who knows but she might have been expecting beef. The train was tested for food value and discarded, then taken up again as a tool,—a poker, pry, and lever all in one. Mr. Ditmars, Curator of Mammals, had already explained to me that apes brought with them from the wilderness an uncanny knowledge of a lever and much skill in its use.

IN THE PLAYROOM

Where the vertical pole makes the youngsters feel quite at home

The toy monkey was received with a mixture of curiosity and suspicion,—an awe which Professor Kroeber believes is akin to the religious "thrill". Jimmie just naturally edged away and let Ellen do the experimenting. She circled around and several times put out her hand, only to draw it back again. She poked at it ineffectively with a handful of straw, then with the toy train as a lever she turned the animal over. Like a cat with a mouse she finally seized it with her teeth. Unfortunately a noise startled her at the moment. She dropped it and sprang away. We could not induce her to go near it again though she continued to cast suspicious glances in that direction.

Junior wanted to know if Jimmie and Ellen were ever naughty.

"Yes, sometimes they are very bad apes. They love to smash things up and tear things to pieces. When children do that, their mothers usually say they are curious but not destructive. Well, these baby apes are very, very curious and very destructive. Often when they're cross and can't have what they want, they go into a regular temper tantrum and jump up and down, throw things around, and even bump their heads against the wall."

Junior glanced at me with amusement and we both looked knowingly at brother Alan, just turned two. Only that morning he had failed to acquire an apple he desired. Howling and jumping, he had looked frantically for something to throw and in desperation had run into the bathroom and pulled all the towels off the rack.

"If they are punished, they will remember to be good only as long as they are being watched. As soon as they are left alone, they will repeat the identical offense."

A delivery boy came in soon with a large carton of drugs and hospital supplies. Dr. Noback had to leave the room. Sure enough. As soon as he went out the door, Jimmie and Ellen, who had been sitting quietly inside the cage with the door wide open, suddenly walked out and danced around the floor. When he returned, they tried to hide and then led him a chase on his hands and knees from one corner of the room to the other. Like many a mother, he dared not be cross for fear of precipitating a temper tantrum. When he finally lifted them in and casually closed the door, Alan started to whimper, full of sympathy for the little friends who evidently had been "shut in their room for punishment". The apes seemed to sense the youth and sympathy of the human baby and to resent the more prying curiosity of the older boy. Once when Junior was talking excitedly near the cage, Jimmie stuck out his hand and in a very disgusted manner pushed the boy's shoulder as if to say, "I wish you'd get out of here anyway!" The doctor tried to soothe his feelings but he was plainly peeved and edged away into the corner of the cage.

"We almost forgot to ask if they were good at night."

"Model children," he said. "They go to sleep right after supper and the hospital force leaves for home. The patients are left alone from six at night until seven in the morning, except for the regular Zoo watchman who comes around every two hours like a night nurse. He always finds them sleeping soundly on their bed of straw, snugly entwined in each other's arms."

The SUB-CELLAR BIRDS

Burrowing Owls of the Desert

by Lewis W. Walker

A DEFIANT GROUP DARES THE CAMERA TO DO ITS WORST

They are even so unafraid as to be rather curious about it all

THE MOTHER IS RATHER MORE PERTURBED

She has precious eggs to watch over, and doesn't like the intrusion

WHERE once the buffalo and antelope reigned supreme, there have survived only the smaller creatures—smaller, yes, but none the less interesting. Countless prairie dogs still live on the great plains and within their colonies may be found the burrowing owls; quaint, wise little fellows that inhabit the deserted underground homes of other animals.

Many people believe, even to the present day, that the prairie dogs, the owls and the rattlesnakes all live in the same burrow in perfect harmony. Occasionally an owl will take shelter in an occupied prairie dog hole, but only until the danger of a hawk or a passer-by has vanished. Sometimes a prairie dog will try to take refuge in a hole occupied by owls, but he is usually met by such stiff opposition in the way of outspread wings and hisses, that he soon departs to the homes of others more appreciative of his company.

The owl's nesting hole is, as a rule, the deserted burrow of a prairie dog. These rarely exceed four feet in depth and are usually not more than five and six feet long. At the end of the passage is a chamber about ten inches high and approximately a foot across. This is used as a nest. As these owls are unable to dig their own burrows they must take those of some other animal, so the construction of the nests varies in different regions according to the types of animals.

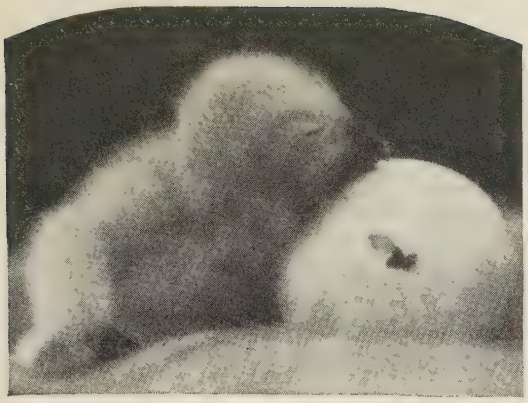
By exceptional good fortune, I found an occupied nest in a short, fairly straight prairie dog den. I dug a pit a foot behind the spot where I believed the nesting chamber to be, and then tunneled into it. The dirt was removed from the top of the nesting chamber and a pane of glass laid horizontally in place to permit light to enter. Another pane was placed vertically between my pit and the chamber to prevent the owls from using the new opening as a means of entrance and exit. Then the glass was covered with sacks and boards to keep out the light until the owls had become accustomed to the change. The question then was, would they like the new arrangement or would they move to another abode to foil my efforts at photography?

The following day when I removed the sacking and boards half-heartedly, I was more than thrilled to see the old owl calmly brooding her eggs. My plan had worked.

A few days later I set up my camera, and by looking through the vertical glass the actions of the owl could be watched successfully. At first she resented the camera and fluffed her wings and

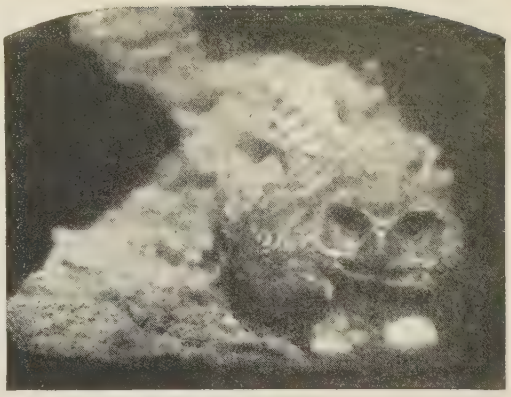
(Left) DIGNITY PERSONIFIED

Showing all the wisdom of youth. Below, the fledglings group themselves for a last picture while the parents hover anxiously



(*Left*) HASN'T SCRATCHED YET
Note the chisel-like horn on the end of the beak

(*Right*) THEY SHALL NOT PASS
The mother, resenting the camera, protects the eggs



feathers, hissed and snapped her bill. Tiring of this, she began rushing with outspread wings toward the hand with which I was operating the camera. As this did not succeed in driving me away she retired to a corner and seemed undecided whether she should desert her nest or stay and fight. She glanced many times at the glass above her head as though questioning its origin. It certainly was not there when she appropriated the burrow! After a time, however, she settled down on the eggs in a normal setting pose, her feathers unruffled.

A week or so later, the eggs hatched and one of the downy youngsters and a hatching egg were photographed together. The small, sharp, chisel-like horn on the end of the bill showed very plainly. The young birds use this to crack and pry open the shell.

Anyone reaching into the nest after the birds are a week or two old would think a number of ferocious rattlesnakes were about to emerge, due to the peculiar rasping, rattling hiss of the young. Perhaps this sound formed the foundation for the legend regarding prairie dogs, rattlesnakes and owls and their domestic relations.

The food of my subjects showed them to be extremely beneficial, and worthy of thorough protection as are most of the other birds of prey. I found the most successful way to observe their eating habits was to blockade the hole for about an hour a day. The parent birds would then bring food to the young but finding they could not enter, would drop it at the entrance and soon return with more.

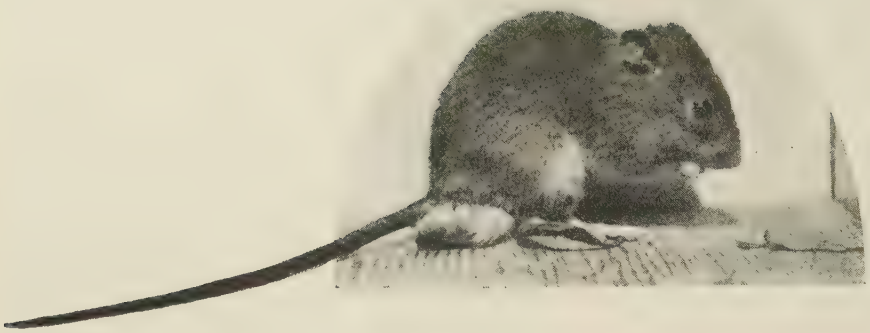
WELL! ANY INSECTS?
But the camera merely clicks in reply. The fledgling below is rather more sociable

A catch of about an hour and forty minutes contained the following: seventeen large beetles, twenty-two grasshoppers, two lizards, a small tree frog or hyla, and a prairie jumping mouse. Another catch contained a small garter snake, a striped spermophile and a number of grasshoppers and beetles. Still another contained a number of insects, a house mouse, and a very young horned lark. The grasshoppers and beetles are usually brought in alive, the latter with the abdomen crushed, and the former with the jumping legs removed, but both are still able to move in a slow crawl. I did not notice this habit of bringing in living food when the nest contained eggs, so I believe it is done as a method of teaching the immature owls to catch their own food.

When the young were almost fully fledged a few more pictures were taken within the nest chamber and a few at the entrance of the burrow where the young posed most obligingly, while the two adults sat on a mound about twenty feet away bobbing up and down as though worried at my handling of their young.

These photographs were, unfortunately, the last taken of the family. The following day a terrific hail and rain storm flooded the slight depression which contained the nest and all of the young birds perished.

That afternoon the adults hovered above the spot on tireless wings uttering four screeches, the first more prolonged than the others. Along toward dusk the calls changed to a solemn *cooo—coo* which lasted well into the night, as if the parents still mourned their loss.



THE HAWAIIAN RAT AT LUNCH
A shy little rodent which scientists class as a distinct species

The RAT that DOES NOT GNAW

Rare Hawaiian Rodent Long Thought to be Extinct

by Lorín Tarr Gill

RICH though it is in many things, there is one thing with which the Hawaiian Islands do not abound. That thing is mammal life. When Captain Cook visited these Pacific Islands back in the last quarter of the eighteenth century he declared that there were only three animals,—the dog, the hog and the rat. Came commerce and ships and with them, perforce, the familiar and pestiferous Norway and black rats. To cope with this immigrant element the mongoose was introduced, and, soon afterward, the native rat disappeared from view and seemed to have been swallowed up behind the veil of extinction.

Since Hawaii is exotic itself, perhaps it was only natural that this home-grown rat should be different. It chose to show its individuality in dispensing with the rattiest of rat qualities,—it didn't and doesn't gnaw. Yes, the present tense holds, because, despite the mongoose, the Hawaiian rat has not joined the legion of the lost species. Only recently John F. G. Stokes of the Bishop Museum of Honolulu, after long search, found this little mammal. Doing research along the island shores, he came upon the remains of rodents, later to be identified as those of the native rat. Then, among the scattered shore plants and scanty grass of Mokapu Peninsula, Oahu, several small holes were discovered, suggesting that the mongoose and imported rat had not reached that far.

COCOA PALMS ON THE ISLAND OF OAHU
It was near this one of the Hawaiian Islands that the rats were found

Finally one day, Mr. Stokes saw a flash of brown as a small animal disappeared from view. The hunt was on in earnest and traps were set to catch alive these survivors, if such there were, of a decimated family. The traps worked. The catch established that the Hawaiian rat grows

to be about 238 mm. long and is of a cinnamon brown or russet color above, shading into cinnamon buff on the sides and light buff or buffy white below, strongly mixed with black hairs on the back and sides. The feet are nearly white above, the dusky color of the legs overspreading the tarsus and carpus and narrowing to a point. The whole underside of the feet is dark.

These rats were taken on the islet of Popoia, a flat piece of raised coral reef, varying in height from four to seven feet above the sea. Its area is only three acres and it is just about a furlong from the main shore of Kailua on the eastern coast of Oahu. The surface of the islet is broken abruptly by many hollows about twenty by thirty feet in size and is honeycombed by small vertical and horizontal holes. In every hollow there is soil of volcanic origin and below its level, in spots exposed by the never-idle waves of the Pacific, there is a phosphate rock rich in relics of the past.

A PAIR OF RARE RATS

(Below) Tiny coral islet off the east coast of Oahu, where the Hawaiian rat had its scientific renaissance

Milo trees cover about one-fifth of the lee side of the island and the open area and depressions are well covered with the common salt marsh weed and three native grasses. These, with several small berries and the seeds of the milo, are suitable for rat food.

Skinks and lizards are abundant as well as the usual shore and rock crabs; two species of petrels nest on Popoia, feeding at night; and other migratory and shore birds—the plover, turnstone, snipe and two varieties of land birds—pass the darkness there. The islet is occasionally visited by the owl or some predatory night birds, but the Hawaiian hawk has not been seen in the vicinity.

One May day, another pair of native rats were taken on Popoia. A fortnight later, after a trap had been out seven days, a female was found. Then, believing that it was wise to let the animals breed, no more trapping was done until September when another male and female were secured.

Finally, three live creatures were taken to Honolulu and were placed in two cages,—a male and his mate in one and a second female in another. The new homes were boxes of comparatively soft wood with the tops and sides removed and were completely covered on the outside with half-inch mesh wire. Though, for the first few days of their captivity, the rats tried to bite through the exposed wire, it was considered remarkable that they made no attempt to gnaw their way out through the wood.

"It would seem," Mr. Stokes says, "that there is a comparative weakness in the gnawing system of the Hawaiian rat, due, probably, to underdevelopment in the species. Such a probability could be explained if we were to take into consideration the conditions under which the house varieties of the different species operated.

"Foreign rats and mice have had, for very many of their generations, closely fitting wooden walls and floors to contend with and innumerable enemies to compel them to keep close within the shelter of such wooden constructions. The Hawaiian rat shared the open life of its human neighbor, had few natural enemies except the same neighbors, and found the grass house walls and loose stone foundations and floors places for easy hiding."

Observations on the habits of the native rats were conducted with difficulty. The cages were fastened just outside window sills so that the little animals could be watched from the room through the uncovered wire at the top. But their reaction to sound and scent was so sharp that they could detect the quiet approach of an observer before they could see him and would then remain motionless, except for twitching snouts and ears, as long as a person cared to watch from a little distance. A nearer approach to the window would cause a scurry for the sleeping box and subsequent observations would then be limited to the pair of twitching noses poking out of the box opening.

"The appearance of a person above the cage always terrified them," Mr. Stokes says. "Later, the cages were changed to a window where the rats were just above the level of one's head when standing on the ground. In this situation, one of the rats became tame enough to eat from (and of) the fingers. However, movements above the cages continued to frighten them as much as ever and the upper part was subsequently covered over.

"Noise of any kind disturbed them, particularly the sharp snapping of the cage wire when opening the door. Then they would freeze as though expecting to meet their doom. It is evident that any future observations should be conducted in a cage which can be handled noiselessly.

"They were on the move during the whole day and fed freely at that time. Judging from the noise their greatest activity is in the early part of the night. Their long sleep must take place between nine o'clock in the evening and eight o'clock in the morning.

"Their food has been bread, cooked meat, bones, fresh and smoked fish, lettuce, sow-thistle, cabbage, wheat, oats, walnuts, apples or anything else in the house. Bones are not closely gnawed. Living sow-bugs and parts of centipedes are eaten readily, the harder portions being chewed for some time and then ejected.

"During the damp weather certain snails were very plentiful and the rats ate them readily, biting through and completely crushing the fragile shells with ease. They sat on their haunches and held the snails with their forepaws and, in less than an hour, twenty-one of the snails were eaten, indications being that more would have been consumed had they been offered.

"As many of the Hawaiian terrestrial mollusca are smaller and are provided with fragile shells it is believed that they may well have contributed to the diet of the native rat before it was displaced by the introduced species."

Rattus hawaiiensis, though described as a distinct species, has been determined to be a slightly differentiated member of the *R. concolor* group.

But how did *Rattus hawaiiensis* come to Hawaii in the first place?

Probably, by a gradual eastward dispersal from the Malay region out through the islands of the Pacific by way of native boats at a date which cannot be supposed to be very remote. Whether or not the animal has developed its supposed diagnostic characters since its arrival in Hawaii, or whether these characters are actually identical with those of the imperfectly known Fijian or Tahitian rats are questions, scientists say, which cannot be answered at present.

But the rats of the Pacific Islands are of intense interest to ethnologists as well as zoologists. The knowledge of their dispersal among the coral atolls and volcanic land masses of that vast area, it is believed, will furnish many a clue to the problem of the origin and migration of the Polynesians—a question which is of paramount interest to American anthropologists today.

A BALL of TWIGS

A Waterfall Product

by Charles N. Christman

SWIRLING and whirling in the overflow of water from a cranberry bog, an overflow which takes the form of a miniature waterfall as the excess pours over a sluice gate, each year an unusual ball of twigs forms for the interest of Nature lovers. The one most recently produced has just been deposited in the Commercial Museum in Philadelphia.

Dried, but still retaining its compact, egg-shaped form, the ball gives rise immediately to the question: "What animal or bird builds a nest like that?"

But it isn't a nest. It is a solid, tight ball of small twigs, the component parts being so interlaced that the whole sticks together and can be handled almost as freely as one would handle a football.

IT LOOKS LIKE A BIRD NEST

The stream making it rises at Mt. Misery, flows through Double Trouble, but comes out at Good Luck

The ball is twenty-nine inches in circumference, the long way, and twenty-six and one-half inches on the short axis. Its axes are of ten and twelve inches, respectively.

Edward Crabbe, president of the Double Trouble Company at Toms River, N. J., sent the ball to the Commercial Museum through George William Bassett, of Tuckahoe Road, Fairview, Camden, N. J. The creek which forms the cranberry bog and whose waters, flowing over the sluice gate, produced the ball of twigs, rises at Mt. Misery. It flows through Double Trouble but everything comes out all right, because it empties into Barnegat Bay at Good Luck. All of which sounds as if it was kin to the River of Doubt.

Six-Legged Warriors

A View of Some Battlers of the World of Insects

by S. F. Aaron

Illustrated by the Author

Throughout the realm of Nature, warfare and butchery are the means by which a very large proportion of creatures exist. The flesh-eating species about balance those that are strictly plant eaters, however. This predatory practice exists, of course, in the insect world, where the struggle for existence in Nature is just as keen as among other forms.

The terms banditti, assassin, murderer, though often used in this relation, are, however, distinctly out of place as applied to rapacious animal life. Only in very rare instances with a very few species do the killers make war upon their own kinds, and, although it has often been asserted to the contrary, actual cannibalism occurs but seldom. Even ants, in their annihilating warfare after the manner of ancient peoples, battle only with other, though often closely related, forms, and this is true also of the slave-making species.

Let us correctly consider the rapacious insects as mere hunters and huntresses, the latter sex of course greatly predominating. Many of them, no doubt, experience what would be to the human mind excessive thrills from the manner of overcoming their prey or quarry, but there is no evidence shown of the spirit of sport, as among some of the higher vertebrates: the wolves and wild dogs, the cats and others. Man, of course, leads in the sheer and useless cruelty of killing, being practically the only animal that is frequently eager to destroy his own species.

PREPARING FOR THE ATTACK

The bee-like robberfly surveys its intended prey, the bumblebee, before pouncing upon it

Warriors the insects are, however, possessing a courage equal to that of Saint George, or the god Thor when he journeyed to Jotunheim. Some of the warlike exploits among the six-legged insects are, indeed, not unlike the human heroics of old; the foemen are often more than worthy of the stings or lancet-like beaks of the aggressors. Upon rare occasions the patient and almost continuous observer may chance upon one or another of these sanguinary contests, though they do not happen frequently despite the necessity of obtaining food. Nature has a common manner of pursuing the course of least resistance and for the most part her warrior creatures seek victims that are easily overcome. However, hunger and opportunity may at times spur the hunters to unusual daring, and to witness these comparatively uncommon occurrences the observer may be excused for bringing them about by furnishing the opportunity under natural conditions.

Most voracious of all the winged insect butchers are the many species of robberflies, and while years of field study will be rewarded by seeing these marauders seize upon such victims as cannot give them battle it is rather rare to find them engaged in overcoming other killers quite as bloodthirsty as themselves. My own description of the meeting between a sandhill hornet and a giant black robberfly, in which the latter suffered death, was one such chance; it has been quoted too often to bear repeating here in detail. Another opportunity was that of seeing a robberfly, *Promachus vertebratus,* attack a wheel-back bug, *Prionidus cristatus,* the latter taken at a disadvantage from the rear and unable to employ its deadly proboscis, though its defense was none the less effective, for it merely lifted its long hind leg and before the robber's sharp

WHEN HUNGER IS INSISTENT

The wheel-back bug claims as its victim a well-armed wasp

are eagerly attacked, but not always successfully, especially the diggers; with their long-petioled abdomens, they can reach far enough to puncture the robbers. Most interesting it is to see a medium-sized robberfly of slender build attack a ground spider, the winged insect invariably coming off victor.

One of the most pathetic and truly repugnant instances is that of a bee-resembling robberfly pouncing upon a busy bumblebee and killing it. The peaceful-minded honey gatherer is unable to use its sting against an enemy perched upon its back; the robber's long and powerful legs hold it beyond danger while the stiletto-like bill gets in its work.

Though lacking the dashing boldness and unhesitating vigor of attack that characterize the robberflies, those "assassin" bugs of the family Reduviidae are little less daring. The big wheel-back bug before mentioned and various smaller black and red, dull brown and shining black forms may be, among insects, likened to the cat family of mammal life because of their stealthy movements. Some of the smaller species fly swiftly, but are much more at home on their legs, and though they are almost abnormally bloodthirsty they never give chase.

It is not difficult to stage various contests with the common wheel-bug as a participator. Simply place one of these killers on the ground among rotting fruit, or wherever insects of all kinds are attracted. *Prionidus* will perform. The first

(Right)
SPARRING FOR AN OPENING

Black ground beetle and blue tiger beetle about to attack one another

THE OPENING GUN OF A BATTLE

The digger wasp chooses a ground spider as its prey and a stiff fight is impending

beak could be employed kicked, or rather shoved, its more active foe to an inoffensive position.

Contrary to statements too often repeated, robberflies do not commonly take their prey upon the wing. Probably they never do unless the victim flies close by and very slowly, as perhaps a honey bee returning to the hive and heavily laden. Robberflies are frequently credited with a superior wing power and eyesight that they do not possess. They cannot be sure of the object of their attack beyond ten or twelve inches, for arthropod eyes are exceedingly limited as to distance and the recognition of form. Though they are normally speedy the robbers cannot capture a swift fly in midair. I have watched these insect marauders seizing honey bees about the hive. They invariably lay in wait and pounced upon the unsuspecting prey after it had alighted, and so most robberflies hunt at all times.

Hornets, sand hornets, paper-nest wasps and even the long-bodied, spider-killing digger wasps

eager searcher that comes its way and hesitates long enough close by is approached with extreme caution suddenly to be stabbed by the terrible bill which transmits a salivary venom and is also a tube through which the juices of the victim are pumped into the interior of the hungry bug.

Thus the redoubtable paper-nest, white-faced hornet is attacked, the irascible yellow-jacket, the paper-nest wasp, the bumble-bee and almost anything else upon which the assassin may dine. In all cases, as with the robberfly, defeat attends upon inability to use weapons of defense, the attacker choosing position. In one instance a small, voracious, dark "assassin", *Sinea diadema,* which had previously killed a yellow-jacket, *Vespa diabolica,* seized a paper-nest hornet, *Vespa maculata,* a little larger than itself and in such a manner that the latter could employ its sting. There was a quick interlocking of twelve legs and the bug was dead or dying in a jiffy. I have always deplored the fact that I could not see this scrap clearly enough among some clover to make a faithful sketch of it.

Among the most interesting of the predacious insects are the tiger beetles, Cicindelidae, and those other ground runners with killer habits, Carabidae. It is well-nigh impossible to cage these creatures so that they will undertake to make captures or to meet each other in combat, for they become bent chiefly on escape. A naturalist friend tells me of seeing a fight between the little common black *Harpalus, H. pennsylvanicus,* and the brilliant, shining blue tiger, *Cicindela sexguttata,* each intent on feeding upon the other. But no sooner had they clinched, the Carabid seizing the tiger beetle's leg and the more agile fellow trying to make a dent in the thick armor of its foe, than the bright blue insect became aware of its being outclassed and leaving a part of its foreleg behind took to wing.

WHEN TWO FIGHTERS MEET IN DIRE CONFLICT

The robberfly attacks a wheel-back bug and gets a stout kick for its pains

A NAVAL BATTLE

Giant water bug or "electric light bug" tackles a banded water snake

All of the solitary wasps are warriors bold—hunters, most of them seeking nearly helpless caterpillars, grasshoppers, crickets, plant lice and flies that depend for safety only on their ready wings. The big sandhill wasp and members of the family Pompilidae are all seekers of big game, the former overcoming a creature as powerful as itself, though not endowed with a sting, the cicada, the others killing spiders often larger than themselves.

The battles between the southwestern species of tarantula, and the blue, red-winged tarantula hawk, *Pepsis formosa,* have been described; truly heavy-weight bouts. But those of us in the north may witness middleweight and light heavy-weight contests between cousins of *Pepsis* and certain of the Lycosidae in which, for a time, the chances of the two seem about even, the wasp

AN EASY VICTIM

An "assassin" bug vanquishes a yellow jacket without difficulty

eventually winning for the sake of its offspring.

The rear horses, or praying Mantispidae, are valiant fighters. I sometimes wonder if it were not just as well to spell this word "preying", for that they do more than offer orisons, depending entirely upon their own prowess. These creatures look and move as though they had little sense, but they are cleverly discriminative, rarely, if ever, attacking the stinging insects or the so-called "assassins". I placed one of these, the two-thirds grown larva of our common eastern states form, *Stagmomantis carolina,* in the runways of the big black carpenter ant, *Camponotus pennsylvanicus,* and at once the long-bodied grasper had seized the small worker ant by the leg within its own spurred femur and tibia. The struggle that ensued was most amusing. The ant was so far from being a ready victim that, while it could not escape immediately, it met every attempt of the mantis to bite by using its own pincer-like jaws, the result being that the rear horse saw the futility of its attempt and turned to flee in its ungainly fashion, though failing to liberate the ant at once and dragging the black fellow along, biting fiercely and almost stalling the mantis' progress, for some distance. When the ant at last did get free it seemed none the worse for the rough treatment. Over caterpillars, moths, small butterflies, and leaf-eating beetles the rear horse is always victor, but I witnessed another laughable incident when a captured specimen was presented with a long-horned grasshopper about its own size. This the mantis seized by the hind leg and before that member came loose, according to the usual custom, the leaps and struggles of the jumper carried the mantis along with it at a terrific rate, so that the wonder was that it did not let go.

Some members of the stink-bug family are predacious, though the early stages seem to be vegetable feeders as well. This refers to the flat-backed species, with exceedingly long and folding proboscides, which commonly feed on caterpillars often six times as large as themselves. They are no more agile than the "assassin" bugs and in much the same manner approach and stab their prey. I have seen our commonest, medium-sized species attack a large jumping spider which immediately fled, a larva of the golden-eyed fly, which likewise got quickly away, and the full-grown larva of a lady-bird beetle. Following is an entry in my notebook on September eighteenth: "Found adult *Podisus* that had stuck its long proboscis in the first pro-thoracic segment of a lady-bug larva, which was struggling actively but a little later became quiet as its juices were sucked out. In ten minutes the larva is about all in and is dragged along on its back. Twenty minutes later larva dead; no movement of legs. At first dragged *Podisus* about and compelled it to maneuver somewhat, but finally the larva is lifted and held aloft as the bug crawls along."

A LEAF FOR A RING SITE

A stink-bug kills the larva of a lady-bird beetle. Above, the much-enlarged proboscis of the bug

(Below)

SIZE OFTEN DOESN'T MATTER

Young mantis finds a carpenter ant a tough customer and loses a fight

Some of the water-dwelling Hemiptera are perhaps the most ravenous of the rapacious insects. The water scorpions, and the big flat "electric light bugs," the largest of all temperate clime species of the Hexapods, readily attack creatures far larger than themselves and even out of their class, as fish, salamanders and small reptiles. I have watched, in a large aquarium, a water scorpion kill six dragonfly larvae all as large as itself within an hour and then dart about looking for more. In a cattle water trough along the Rio Grande I saw the big water-bug seize upon a small garter snake that I tossed in as an experiment, but the reptile thrashed about so violently that the bug was disconcerted.

I once showed a specimen of the *Belostoma* to a sportsman who was little interested in bugs and he at once became almost excited when relating to me that while fishing he had seen this insect seize and kill a small water snake, the reptile biting the bug repeatedly, but without effect, before its own life blood was sufficiently pumped out to compel its collapse. So go the battles.

For the past two years the American Nature Association has made available attractive Christmas cards for the holiday use of its members. For this year R. Bruce Horsfall has done a group of six of as delightful cards as one could desire. Complete announcment is to be found in the advertising pages but as a matter of service we wish to call it to the attention of our members here.

WHITE OAKS VARY IN TEXTURE
All are light buff gray. The pattern of this one is neat, fine and regular

TREE BARKS
Their Story

by

Mary F. Robinson

Photographs by
Charles W. Robinson

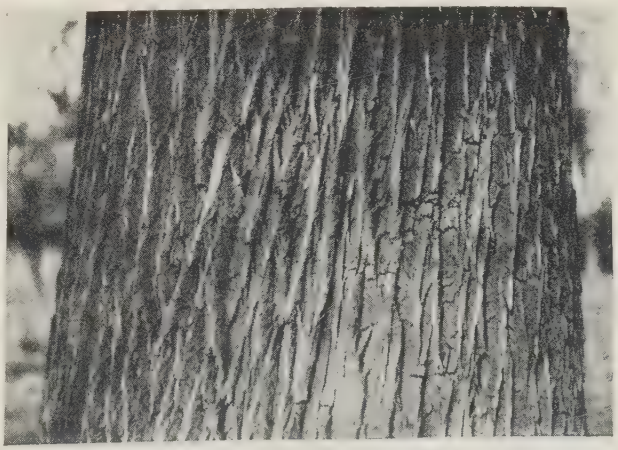
A COARSER WHITE OAK BARK
Firmer blocks of flat ridges are set off with deep, narrow, upright slits

TREE BARKS are both baffling and fascinating. We often recognize them as we do faces of our friends without being able to make clear to others the distinguishing features. They are visible expressions of tree individuality not for one season, but throughout the year, and by pronounced or illusive differences in color, texture, and pattern they play their part in the variety in which Nature delights.

We are hardly conscious of the impressions made by bark characteristics when all Nature is most colorful. It is against the whiteness of the snow and the intense blueness of the winter or early spring sky that the deeper shadows bring out the bark patterns in relief. Then the often brilliant colors of the coverings of the twigs, as in the willows and some maples, the less brilliant harmonizing colors of the smooth larger branches, and the delicate gradations of color to the warm and varied tones of gray in the smooth or sculptured surface of the older hardwoods, are enhanced. There, in the silence of the woods while Nature sleeps, come deeper thoughts, and we sense that almost indescribable beauty of tree barks.

The surface that we see in the trunk and branches is dead and, somewhat like the surfaces of rocks, it weathers away. Rough barks, which crack and split as the tree increases in girth,—like those of oaks, elms, ashes, maples, horse-chestnut, and hickories,—shed at times during the weathering the characteristically shaped fragments,—flakes, scales, or strap-like plates. The smooth barks like those of the beech and yellow wood, which are capable of great distension as the tree grows, weather away without noticeable signs, but some others belonging to the birches sometimes visibly peel off in very thin layers as the weathering progresses. Barks vary in thickness, but when a tree is classed as "standard" in size (one foot to two feet in diameter) by the woodsman the weathering keeps pace with the new growth so that the depth down to the growing layer, or cambium, remains about the same for the rest of the tree's life.

MANY *readers of Nature Magazine will recall the excellent practical and helpful articles by Mrs. Robinson on Tree Leaves, Tree Buds and Tree Flowers. In the accompanying article Mrs. Robinson tells the story of the bark of trees as a companion story to those which have gone before. Now that leaves are falling the article has a timely application, and with its help one can make a fall or winter walk even more interesting.*

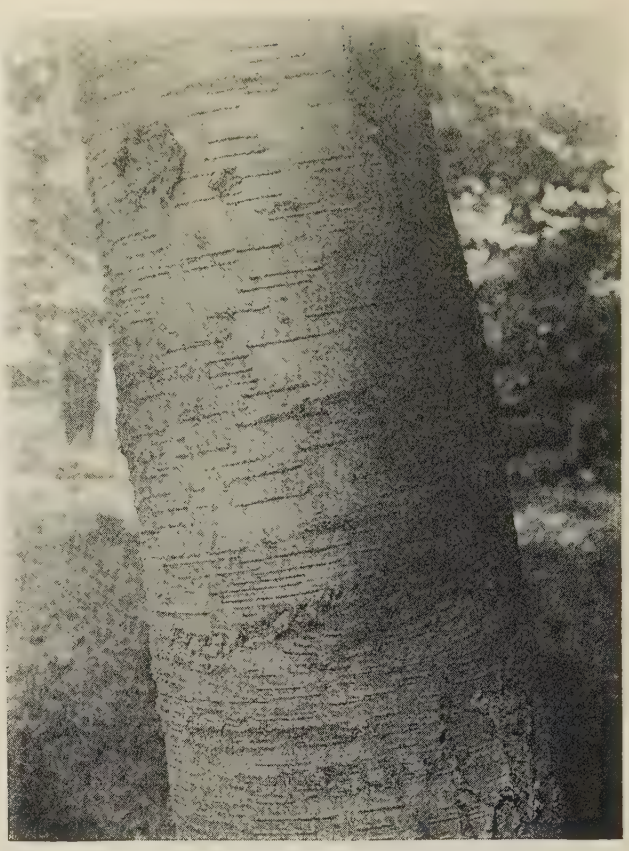


WHITE ASH IS EASY TO DISTINGUISH
Know it by the neat smock-work pattern of firm, narrow, flat-topped ridges and smooth, diamond-shaped furrows

Soil conditions and location, whether in the open or in the deep woods, affect the life of the tree and hence the appearance of the bark. In general barks of mature trees, growing under fairly normal conditions, and whose trunks are from eight to twelve inches in diameter, are best for purposes of comparison.

The thick, rugged barks of our strong and much commercialized oaks hold pretty closely to two shades of gray; the ash gray slightly tarnished, or with a hint

PIN OAK IS SLOW TO ROUGHEN
On the smooth gray part of its bark the lenticels are often diamond-shaped

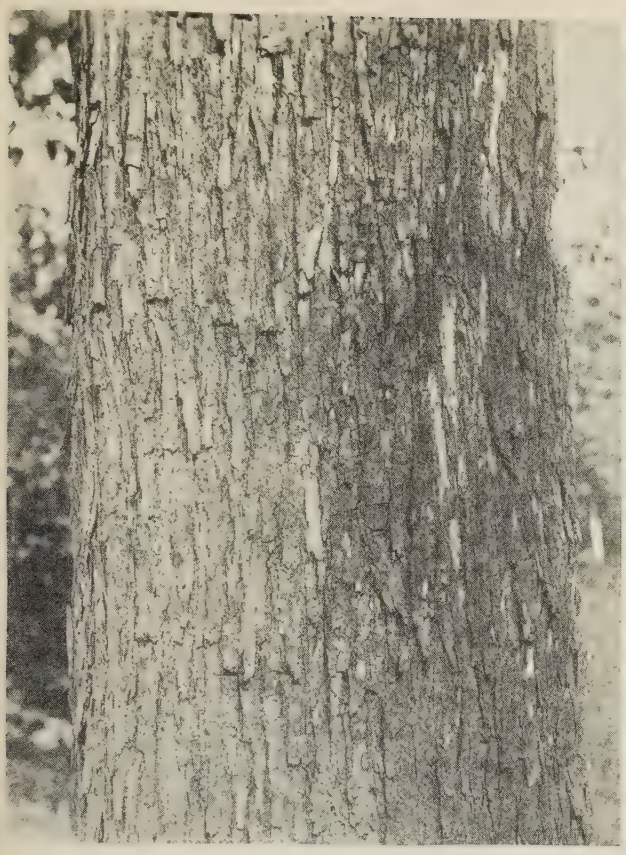


SWEET BIRCH DOES NOT PEEL EASILY
Its satiny, reddish-brown bark has prominent, horizontal, line-like lenticels

of buff in its tones, belongs to one group, white oak, swamp white, bur, and post; the other group of oaks, red, scarlet, black, and pin, are of the very dark gray with a hint of brown which looks nearly black in the distance. These two groups show also two distinct ways in which barks may break. The barks of the oaks of the first group have straight splits with smooth walls such as we see in seasoned timber, but the cracks of those of the second group are like furrows or miniature yawning canyons with rough slanting sides which leave ridges wider at the base than at the top. The white oak itself is as a rule very neatly clothed, for the numerous vertical slits, equally distanced, divide the pattern into long, narrow, flat sections which are marked off by horizontal cracks into little rectangular blocks easily flaked. Occasionally we find a bark of white oak which likes to copy the coarseness of that of its cousin, the black oak, with deeper cracks and rougher ridges between, but it does not lose its pale buff gray. A fairly young swamp white oak leaves the impression of a tone of pale gray in its covering more sombre than that of the white oak with rougher and larger loose flakes. The ridges of the bur oak are less broken than either. The most rugged of the light gray oak barks with the deepest crevices belongs to the post oak. In all of the white oak group we find the branch bark sculptured like that on the trunk.

In this latter respect the trees of the black oak group differ, for their branches, unless the tree is a veteran, are generally smooth. The flat ridges that make striking, wide, vertical bands of gray separated by shallow, black-appearing furrows distinguish the red oak. There was a time when it might have been confused with the chestnut, but chestnuts of any size are rare in the woods of today. The coarse, dark gray ridges divided into short blocks with miniature furrows

THE SUGAR MAPLE HAS AN INTERESTING BARK
The trunk may have a tight bark with color pattern of upright bands of light and dark gray



THE TRUNK OF THE HOP HORNBEAM
Its oblong portions are narrower than the divisions on other rough-barked trees

THE BLACK OAK IS EASY TO NAME
The regularity of its furrowed, rough-sided cracks distinguishes this oak member

of about the same width, depth, and color through which ants like to clamber present a regularity which helps us know the black oak. The scarlet oak, while it resembles both the red and the black in the rough portions, lacks the evenness in the division of the ridges, and also in the height of the blocks. The tendency of oak barks to separate the ridges into blocks of fairly uniform length for each species, and their preference for tones of brown gray are distinguishing marks of individuality.

Other common rough barks with furrows are those of the elms. The graceful white elm holds aloft in its crown a mass of small tapering branches each with its bark sculptured almost to its tip. The dark gray ridges even to the base of the bole from a distance appear characteristically speckled. Close inspection shows that layers of white and dark corky material make up the ridges and, when weathering removes the small flakes, parts of the white layers are exposed. The ridges are broader than the furrows and slits, for there are both in one tree, and often either on the branches or on parts of the trunk the furrows are interrupted so that the ridges form a diamond-shaped pattern. This inconsistency of pattern is common among the elms. Although there are no layers of white in the slippery elm ridges, the bark weathers in spots to different tones of gray, giving a characteristic patchy appearance.

The white ash, the painter's tree in form, has a bark which for its regularity would delight the pen artist to sketch. Its interrupted, comparatively small, diamond-shaped furrows surrounded by firm, narrow-topped ridges suggest the pattern of smock work once so common on little girls' dresses. When old and scaled off by weathering, it still retains that neat, firm, interlaced appearance with the narrow top of the ridges

A TREE WITH A LOVELY BARK
The canoe birch whose bark peels of its own accord and often hangs in fringes

SMOOTH GRAY BARK OF YELLOW WOOD
The lenticels of this tree are marked by small blister-like excrescences

lighter than the gray hollows between. The same pronounced pattern in miniature shows on the large branches, but the smaller branches are smooth. In the thicker woods the tall straight branches of the sapling ashes are conspicuous; wavy, dark, upright lines on their light gray barks resemble pen strokes from a distance. Oaks, elms, and ashes have barks that in some cases flake off easily, or else, while their ridges are apparently firm, they crack up in such a way that we know flakes must disappear by weathering.

But the native maples shed their barks in larger fragments, as scales, plates, or straps. On red maples the scales of varying sizes and thicknesses between the longitudinal slits curl slightly outward on their edges. In the older barks the ridges become long, roughened, gray straps free at the edges with no regularity in the scaling or in the shades of the weathered grays. But always in the smooth grays of the branches or of the saplings we sense a hint of the red which is so cheering in the twigs, buds, flowers, and autumn leaves. The silvery-gray bark of the silver maple in some trees is surfaced with narrow, thin, oblong scales one to two inches long and loose at the lower ends, while in others the plates are so broad and long that they resemble those of the shagbark, and they curl back both at the top and bottom. I have seen silver maples with plates actually like straps, for they cling at the ends but free themselves in the middle making an opening under which the fingers may be passed. Sugar maples in company with Norways often grow by the side of the road. You can easily pick out the former with its broad, light gray, firm, close-fitting, upright straps which sometimes turn outward along one vertical edge and cling firmly by the other edge. The fine, firm, lacey bark pattern, finer than the ash, belongs to the Norway.

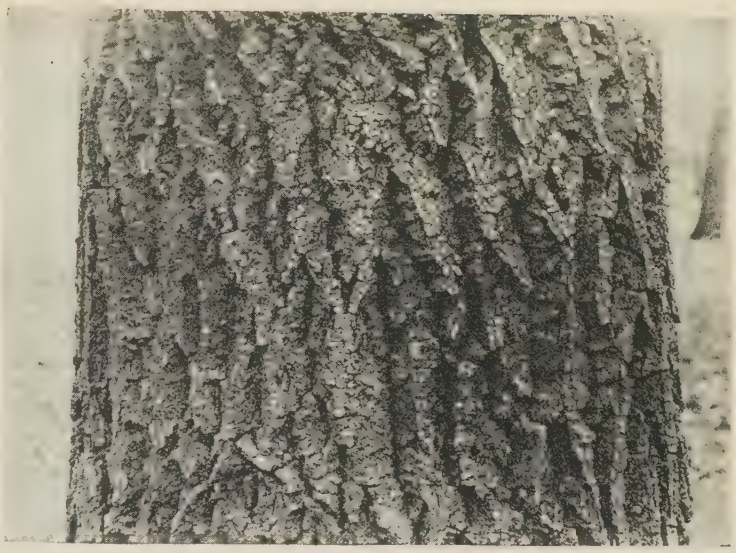
The hickory and butternut barks expand, leaving ragged edges on their ridges, or a suggestion of fine connecting strands between the pronounced ridges, so that the general effect of their vaguely interlacing bark pattern suggests the appearance of old and much worn silk or cotton when pulled apart. The bark of a fully matured shagbark is the most characteristic of those belonging to the hickories, with its wide, tough, flat plates which are loose at the base or at both ends. Butternut bark has in

THE SMOOTH AMERICAN BEECH TREE
Its velvety surface in certain lights seems uniform in color although mottled

THE SCARLET OAK BARK
Its blocks are not of uniform length or thickness. It is brownish gray

some parts large, pronounced, diamond-shaped figures formed by broad, flat, very light gray ridges and inclosing shallow, rather smooth, darker fissures.

The smooth trunk barks of mature trees are fewer in number and because of wider variations in color and appearance are better known or more easily recognized. The leaden gray bark of the American beech, when viewed near-to, appears speckled with small, diamond-shaped, black spots where the breathing pores or lenticels come; that of the yellow wood, often similar in tone at a distance, has blister-like excrescences of the same gray around the lenticels; while the American hornbeam intensifies its identity by the rounded, projecting, muscle-like ridges over which the smooth gray bark closely fits. The numerous, horizontal, close set, and comparatively long, line-like lenticels are prominent on the barks of birches and cherry trees. But it is the soft silkiness of the bark and the beautiful tints of color that make some birch barks so choice. Under the papery layers that of their own accord peel back horizontally in narrow strips, there are the most exquisite pinks, light orange reds, and pale yellows in the canoe birch barks. Two differences between the bark of the canoe or white birch and that of its twin in color, the gray birch, is that the chalky whiteness does not rub off from the latter nor does it peel of its own accord, nor can it be peeled easily. The yellow birch has long lines of ragged fringes made of silvery yellowish-gray, thin layers of peeled bark, while the river birch is very untidy over all its branches by its rolls or fringes of reddish or brownish, thin, silky bark layers. If there is any doubt as to whether you have found a sweet birch or a wild cherry in the woods, for both may have on the branches the smooth, reddish brown bark that does not peel of its own accord, you can identify the sweet birch by the wintergreen flavor of its twigs and the cherry by the bitter taste.



THE BARK OF CHESTNUT OAK

It has smooth-sided, V-shaped furrows and inverted V-shaped ridges

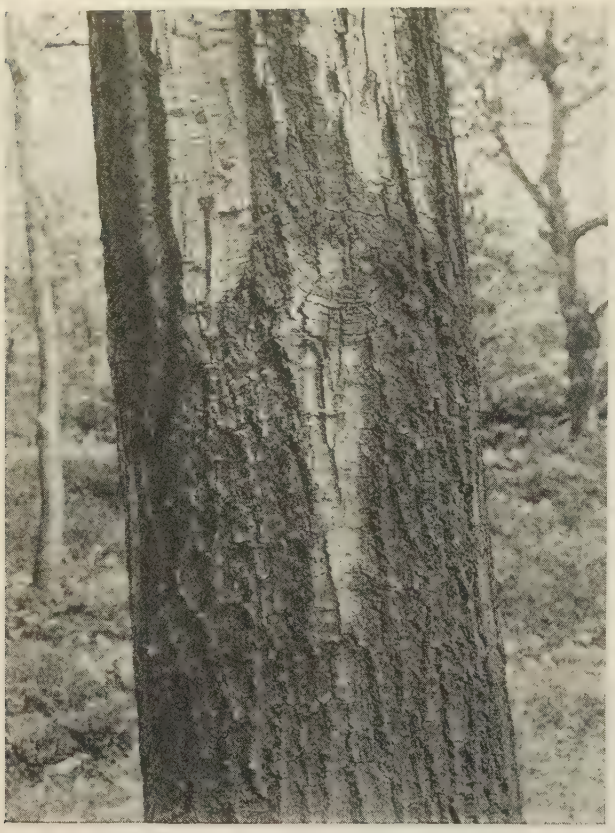
BARK OF THE SLIPPERY ELM

It resembles the white elm in its covering in a number of quite distinctive ways

Endless enjoyment may be found in bark comparisons even when only characteristics that can be easily seen are considered. With the magnifier a study of lenticels on young branches opens up a wider field. A gradual development of the bark pattern for rough barks from the beginning in the small crack through the lenticel, to the intricate network of slits or furrows is interesting to trace. When a log is cut and a cross section of the bark is found some details of structure may

ONE TYPE OF SILVER MAPLE

This has narrow, thin, silvery-gray scales which are free at the lower end



HERE WE HAVE THE RED OAK TREE

The broad, flat, gray, upright ridges separated by shallow, darker and narrower furrows identify it

BARK OF A MATURE SHAGBARK TREE

Its bark splits into wide, tough plates which are free at the lower end or at both ends

help to determine the species. Pieces of oak bark on the inner side always show where the medullary rays, those close set radiating lines so prominent in oak wood, have entered the bark. The tough, strengthening fibres called bast are found in varying quantities in different barks and in two layers instead of one in that of the linden or basswood. The outside, dead, corky layers are impermeable to moisture; evaporation and passage of air to the living tissues go on only through the lenticels, whose cells are so constructed that they open or close to suit the tree's needs. Lenticels are always there whether visible or not; in rough barks they lie at the base of the cracks. Below the corky layers are living cells of different functions and continuous upright passageways through which moves, mostly downward, the tree food prepared in the leaves. Bark then is the medium for the transference of the tree's tissue building food, and is the protective covering, which not only acts as a buffer to the soft delicate structures that lie beneath, but holds the moisture, vital to the growing cells, within the tree. The cambium, responsible both for the growth of bark and for that of wood within, lies at the base.

Would that all might join the ranks of those Nature lovers who appreciate our tree friends, and learn to know them not only for their manifold uses, but for their wonderful structure and their very evident or more subtle individualities, for their beauty and the wholesome inspiration they offer to those who seek.

I began by saying how much the beauty and wonder of the world occupies me these later years. I suppose if my mind had dwelt much upon the other world toward which we are headed, and which is the main concern of so many passengers, I should have found less to absorb and instruct me in this. In fact, the hypothetical other world has scarcely occupied me at all, and when it has, I have thought of it as a projection from this, a kind of Brocken shadow cast by our love of life upon futurity. My whole being is so well, so exquisitely attuned to this world, that I have instinctively felt that it was for this world that I was made.

—*The Summit of the Years*—JOHN BURROUGHS

THE OSTRICH JOINS THE FARMYARD CROWD
Regarded somewhat askance at first by the orthodox fowl, Inshar soon made herself at home at the veld farm

INSHAR *the* OSTRICH

The Story of a Pet on a Veld Farm

by Vincent A. Wager

"WHAT shall we call it?"

"Percy!"

"Archibald!"

"Marmaduke!"

"Aw! Have a heart! What's Sesuto for ostrich, anyway?"

"NTJCHA!"

"Good! Inshar will do fine!"

Inshar was a baby ostrich about two days old. M'gen, the native herdboy, had brought her in with her feet bound tightly together with a piece of grass, in the hope of earning sixpence. Inshar's history was obscure. When questioned about his find, the picanin was vague, probably owing to the fact that he was loath to tell us that many of her brothers and sisters were to be the main item of the feast at the kraal that night. Ostriches were commonly met with in the veld a few miles from the farm, and the picanin, in his daily wanderings with the cattle, must have spotted a nest.

The rancher had too many animals to care for without worrying about a pet, so that Inshar led a very precarious existence for the first fortnight of her life on the farm. When I arrived in the Lowveld for a month's holiday, the duty of feeding her was gladly handed over to me. Inshar was then about as large as a fowl, but owing to her very irregular meals was exceedingly thin. The skin hung loosely around her massive legs in folds like pyjamas. Her body was covered with small spines like a hedgehog, while her neck was clothed with soft fur like a rabbit. To make up for such ugliness, however, she had the most glorious long eyelashes, more in keeping with those of a cat. A more peculiar or interesting little pet would be hard to imagine.

During her capture, the baby ostrich must have received some injury to her beak, for she appeared to be quite incapable of feeding herself. This, however, was not for want of trying, for Inshar spent the greater part of her time pecking away at marks on the floor and even at such edible objects as pebbles or mealies, but without ever being able to pick them up. Feeding, therefore, was not exactly an enjoyable process, for it meant being roughly gripped between someone's knees and having her struggling mouth held wide open while a couple of dozen mealies or pieces of bread or mealie meal were poured in. We had rather vague ideas as to what food was suitable for a baby ostrich but remembering the

saying, "a digestion like an ostrich," we trusted to luck and Inshar got a varied diet.

Inshar slept in a box under the couch, and during the day, was confined to the living room. Owing to the intense heat in the Lowveld, the farm houses, which are made of poles and clay with a thatched roof and mud floors, are built with an eye to coolness, and the doors and windows have gauze covered frames. Being endowed with a good imagination, Inshar daily stood for hours on end in front of the door pecking at the gauze, and by the way she was swallowing, she must have been enjoying a grand feed of the grass fifty yards away.

INSHAR BECAME AN AQUATIC BIRD

After one fling at swimming she quickly developed an enthusiasm for her daily dip

When she was about a fortnight old, Inshar was allowed out under someone's watchful eye for a run around the yard. The fowls were greatly astonished at the sudden arrival of such a peculiar feathered creature, and did not quite know what to make of her. The ostrich, however, was most unconcerned and calmly walked over to see what the fuss was about. With clucks of alarm, they gave way respectfully save for one domineering old hen that eagerly came forward to put the newcomer in its place. Attracted by the brightness of the fowl's eye, Inshar made a peck at it, and the hen, dismayed by such irregular procedure retired in great disorder. The dogs lying in the shade of the verandah or surrounding trees, never felt quite safe when Inshar was about for she took great delight in walking around them pecking at their eyes or lolling tongues, and in fact she was greatly disliked by all the farm animals on this account. Whether Inshar was absolutely dauntless or else a perfect fool, we could never make out, for the growls and snarls of the dogs, or the hard pecks of the fowls, made not the slightest impression on her.

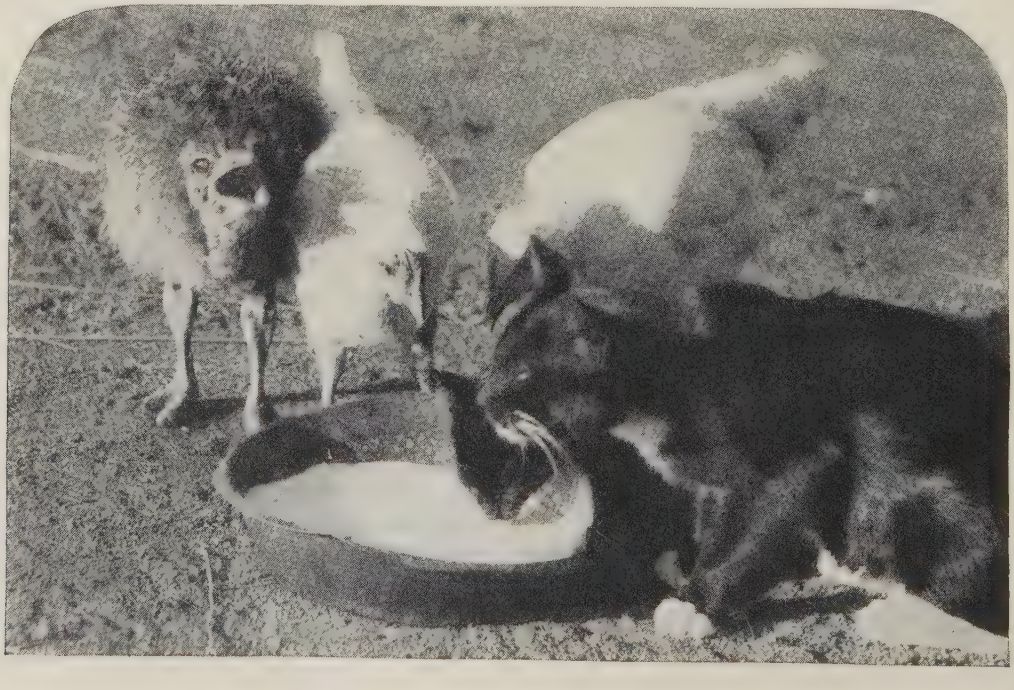
As she showed no signs of running away, Inshar was soon allowed to roam at will all day long and was always to be found wandering around with the fowls. If you tried to catch her, Inshar would lead you a merry race and if you weren't very fresh, would usually win; but if you stood still and called her and made a display of mealies, she could always be enticed within reach.

Inshar was very companionable and would follow wherever you went. It was quite comical the way she stalked along behind you beside the dogs, and she never tired on a long walk. Her love of following people soon led to her visiting the native compound a few hundred yards from the house, and she spent many hours in the company of the picanins and pigs.

Inshar was greatly petted and she often sat quite contentedly on one's lap at night. At first she would peck at the writing of one's book or any other handy object which took her fancy, but getting sleepy, her head would slowly sag forward until it hung floorwards at the full extent of her long neck. At the slightest movement she jerked her head up, blinked sleepily around and then let it sag down again in the most ludicrous fashion imaginable.

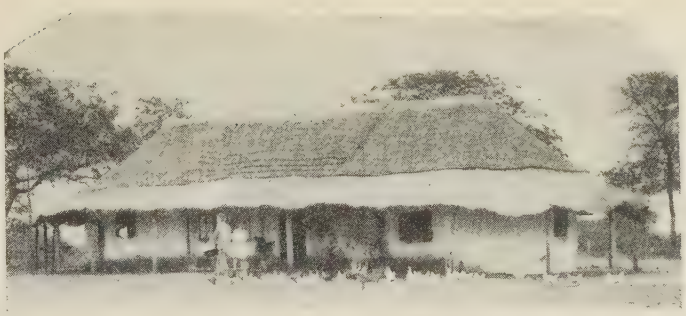
A MIXED GATHERING FOR LUNCH

Inshar seems to be remarking about something on the menu in her very best ostrich



"Hark! Isn't that Inshar's plaintive chuckle?" "Surely not! She was up at the farm half a mile away a short time ago." "Well I'm hanged! There she is, and what a sight!"

We were approaching the bathing pool and there was Inshar, distractedly running in and out amongst the reeds in the sandy bed of the river, wet to the skin. Her feathers clung tightly to her body and accentuated the length of her legs and neck. Just then Ralph, who had gone for his bath a few minutes before us, emerged, half dressed from behind a bush. He told us that while wallowing in the shallow water, he felt something scratching his back, and turning round, found the ostrich swimming beside him, and he thought she must have fallen in.



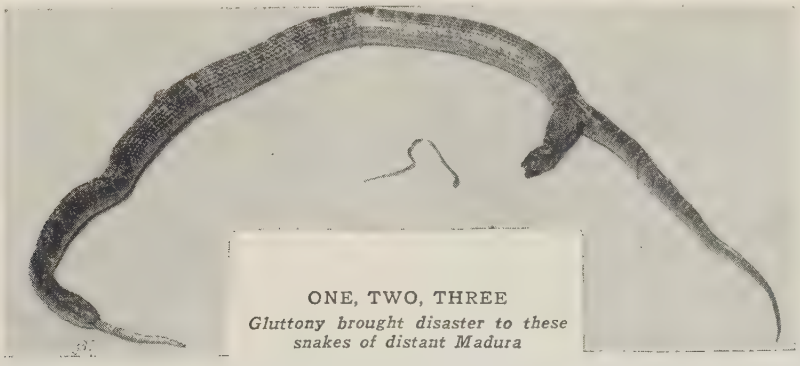
INSHAR'S HOME

The veld farmhouse where the pet ostrich took up her abode

As she looked frightfully miserable and was shivering, Inshar was made to run home, and was soon dry and no worse for her dip. She and a puppy accompanied us to the bathing pool the following afternoon. Repeated urging and calling failed to induce the whimpering puppy to enter the water, but to our amazement, without the slightest hesitation, the baby ostrich stepped into the shallow water and started wading towards us. When she got out of her depth, she started swimming, and soon scrambled into our arms in the middle of the pool. None of us had ever heard of an ostrich being able to swim, but Inshar seemed to enjoy it immensely, and swam around us quite like a duck. After this aquatic exhibition, Inshar regularly accompanied us on our visits to the bathing pool.

* * *

Her love of following people eventually led to Inshar's undoing and untimely end. One morning at feeding time, our pet was not to be seen about the house, but it was thought that she was with the boys at the compound. As Inshar had not returned by about 11 o'clock, we began to get worried and started to search for her, but she was not to be found. In the hope that she had followed the picanin with the cattle, two of us started off after him. After walking for nearly two miles through the bush, we at last found the cattle only to learn that the ostrich had not been seen. Hot and dejected we returned to the house, but Inshar had not been found. Then someone remembered that two strange natives had passed the house at about nine that morning, walking down the road towards the Letaba River. It was possible that Inshar had followed them, so we set out to see. There in the dust were the tracks of two pairs of bare feet and there too was the unmistakable two-toed spoor of our baby ostrich. We followed the tracks for a short distance and then, sick at heart, gave up our quest. Poor little Inshar! Our sweet little pet! Knocked on the head when out of sight of the farm house—a luscious dainty for the kaffirs' next meal! So this is a tragedy.



ONE, TWO, THREE

Gluttony brought disaster to these snakes of distant Madura

SOMETHING NEW IN SNAKEDOM

by Mildred Waldo Hess

SNAKES are cannibalistic. They are, at times, their own worst enemies. And it was a queer sight we saw, two of us, beside the Science Building of a college in Madura, South India, one sunny afternoon.

Stretched out in the shade, and looking as uncomfortable as an overstuffed chair, was a krait, one of the world's deadliest snakes. He seemed to be swallowing something that didn't agree.

We hit at him with a stick, and suddenly, through the skin of his side, popped the head of another, slightly smaller krait, who was still alive, as we could tell from the lightning flashes of the tongue. Here was a snake-Jonah about to emerge!

With care and some fear we carried our snake collection to the Professor of Zoology, who put it in formaldehyde. It was then that a third creature, very small, dropped from the mouth of the krait, who, but for the professor's solution, might have won his freedom.

Thus what seemed to be one snake proved to be three. An economy of space, but rather hard on the kraits! And this warning to gluttons is now safely placed under glass, where all may see, at the American College in Madura.

A DANGEROUS DISTRACTION
How can you learn about violet rays and make the sharp turn?

SEE CALIFORNIA—BEHIND BILLBOARDS

Go West and Read the Signs

by R. W. Westwood

WIND UP the old flivver and let's be off to California, the land of sunshine, beauty, and billboards. Head for the coast, to hear what the wild waves of the Pacific—and the gas, hotel and motor accessory companies of the nation—are saying. All roads lead to the Golden State, and scenes of unequalled grandeur are in store. But don't forget the step-ladder, for there billboards are built big.

If the trip cannot be made this fall, there is no real hurry. The landscape will be there another year, and so will the signs. About four years ago the outdoor advertising companies, meaning mainly Foster and Kleiser, who own about 90% of West Coast billboardia, promised to "clean house". By October, 1930, "the ordinary reasonable man" could travel from one end of the state to the other without meeting a signboard that would offend. California was to be so free from roadside advertising that the change would hurt the eyes of the visitor.

ON THE ROAD TO RIVERSIDE
But perhaps this stretch is not designated as "highly scenic"

There have been four years of "self-regulation", and still the landscape is smeared with signs. Progress has mainly been restricted to two or three "beaux gestes", such as the move of Foster and Kleiser to buy up all the advertising space on the new Skyline Boulevard out of San Francisco, to prevent others from marring its beauty. They have all turned out about the same. About one fourth of the Skyline highway still looks as if it has the measles. The rest is and has been largely controlled by the Spring Valley Water Company and like concerns, who never have permitted signs. Just what the billboard owners have done in the way of improvement remains a mystery.

Now the old "clean-them-up-ourselves" plan is abandoned in favor of a new panacea, concocted with the aid of the California Development Company. All signs will be torn down on "highly scenic" localities, that is, on "generally recognized spots that should be designated as scenic." The planners admit, however,

WHY NOT MORE OF THESE?
The Standard Oil Company of California practices the roadside beauty it preaches

OH! LADY, LADY!
How these plaster monumental food stands improve the scenery

BEAUTY NO END
Who protects the rights of the adjacent property owner, however?

that "in some scenic sections only one side of the highway may be scenic in character." Civic commissions are to help pick out the right sides.

In short, the billboard companies are to tell the people of California and the United States what is scenic and what is not. And there will be no appeal from their decision, note that.

After four years, the billboard situation in California is much the same, with a new program that promises nothing about to be launched.

The former plans and the present ones are mere dodges, to prevent billboard legislation. They are mere gestures made to pull the wool over the eyes of the aroused citizenry, who see a $160,000,000 tourist business being jeopardized by the profit-making inclinations of the few.

The rest of the country is watching to see if the Golden State will be taken in this time. The Santa Barbara Art Commission, the State Federation of Women's Clubs, some automobile clubs and the Redwood Highway Association have started anti-billboard campaigns. A state committee for the Restriction of Outdoor Advertising may soon be formed. The press is on the side of the people. Real opposition to the spoiling of scenic California has sprung up.

The Standard Oil Company of California, which not only does not advertise on highways, but is fighting signs as if they were the plague, laid down the issue in the case of *People v. Outdoor Advertisers.* Its May Bulletin said:

"To permit the defacement and uglification of these highways is to disgust visitors and drive them away. Highways are the show windows of a state. Any practice which arouses the anger, contempt or resentment of motorists on the great annual pilgrimage is detrimental to the state at large. Highway advertising, as now conducted in many places, has this effect."

The Standard Oil Company admits that it is merely good business to take this stand.

California business does not need the billboards. Prospective customers are being driven away. The state is getting a bad name.

There can be no compromise—now—with the outdoor advertising industry. Taxation, restriction, zoning must come. This is not a matter of sentiment—it is the dictate of good business practice.

A $160,000,000 tourist trade or the profits of billboard companies from highways built by the public?

The welfare of the people, or the profits of the few?

California, what is your answer?

BILLBOARDS PEOPLE LOVE
The dark gentleman at the left should be in the woodpile

HOLLY *for all Time*

Northwestern Holly Ranches May Save Native Species

by Edward P. Tremper

Last winter a friend in Oregon sent us a gorgeous box of English holly from one of the western holly ranches. Its beauty was arresting, and, beyond that, it seemed to offer at least a partial solution of the problem of our fast vanishing native holly. We asked this friend for more information and she suggested that Mr. Tremper, of Bellevue, Washington, owner of the largest holly ranch in the United States, tell us something about this young industry. He has done as we requested him in the accompanying article.

IN BUT a few weeks we will be on the verge of the holiday season and our thoughts will be turning to Christmas trees and the green and red decorations of the Yuletide. Once more the annual attack will be made upon our dwindling resources of native holly and ground pine and other wild-growing plants and shrubs used for holiday adornment.

Holly has long been associated with Christmas celebration,—so long that early writers assumed that there was something sacred in the holly tree and called it the Holy tree. A similar holly was found growing wild in this country, and this continued in its place of eminence in the holiday time of the new land. But, as with many of our wild flowers, its popularity was its undoing, and in many sections of the country the native is extinct or rare. "Save the Holly" is the annual slogan of many conservation groups, and such campaigns, together with the vanishment of the holly, have cut down the amount found annually on the market.

Yet the shiny green leaves and the rich red berries of the holly should grace our Christmas decorations. Some substitutes and artificial wreaths and sprays have been brought out and placed on the market. Some of these do well enough but others are so obviously cheap that they are not popular. The natural desire is for the wreath or spray from the living tree, and this demand has created a new industry of holly production which eventually should assure a goodly supply of this colorful decoration.

GATHERING THE CHRISTMAS HOLLY

The English holly trees grow to good size and will produce for many generations

In that part of Washington and northern Oregon that lies between the Cascade Mountains and Puget Sound there is a climate that in mildness and moisture resembles that of England. And this similarity is further borne out by the prosperity which the English holly enjoys in the soil of this region. The leaves of this tree are quite similar to those of the native holly of the East, but the berries are more numerous, somewhat larger, and in closer clusters. It lends itself to the making of attractive wreaths and to general decoration.

In the West there are already several holly ranches, as they are called. They are established much as one creates an orchard, by carefully preparing the soil to a depth of about four feet and assuring that it is well drained. They are permanent propositions because the life of the holly tree can be measured in centuries. The holly rancher, however, must be willing to make an investment in the future because it will be fifteen to eighteen years before there is a ledger profit. The little trimming that can be done in the first years serves only to lessen the cost of cultivation and fertilizing and taxes, but once established it is a valuable property to hand on.

Already the scope of the northwestern holly trade has become nation-wide. Orders from New England

(Continued on page 309)

FORCED HYACINTHS AND TULIPS
They will serve to brighten many a winter day on the window sill

SOIL FORCING BEST FOR THESE
Tulips will not respond to the water culture method as will other attractive bulbs

GROWING BULBS INDOORS

A Fascinating Winter Pursuit for Flower Lovers

by Christian Frank Brockman

It is doubtful if any phase of gardening is more fascinating or more remunerative to our efforts, from the aesthetic standpoint at least, than forcing or growing bulbs indoors. A process wholly within the scope of the amateur, it serves to brighten the drab winter days with gay-colored blooms and, happily, it is not limited by area, by climatic conditions or by experience. Anyone who is able to obtain a flower pot of ordinary garden soil may, with ordinary care, enjoy the warm, rich colors of the Holland bulbs during the season when they will be most appreciated. Foremost of these flowers that may be prematurely brought to perfection by this method are the tulips, hyacinths, daffodils or narcissi and the crocuses. These are the most popular and if the amateur confines his efforts to this group success will be more assured.

If we intend to plant such a winter "garden" we must, in the first place be insistent as to the quality of the bulbs themselves. The inexperienced eye finds in the dull brown globe which is purchased little of the character which causes it to bring forth flowers of such distinctive individuality and, because of their uninspiring appearance, it is difficult to determine their quality unless we are certain of the reliability of their source.

For early flowering the bulbs should be prepared as soon in the fall as possible, from the middle of September until the latter part of October. Then by planting a few at intervals and controlling their development we may avail ourselves of their bold color display throughout most of the winter season.

Growing bulbs indoors and the paper white narcissus are very closely linked together. Every flower lover who has ever tried his hand at forcing has, at one time or another, produced these dainty, starlike blossoms. They respond most readily to the water culture method and the effort required to bring them to perfection is very small indeed. Simply procure a shallow bowl of some kind, cover the bottom liberally with small pebbles and

CAPPING THE HYACINTH BULB

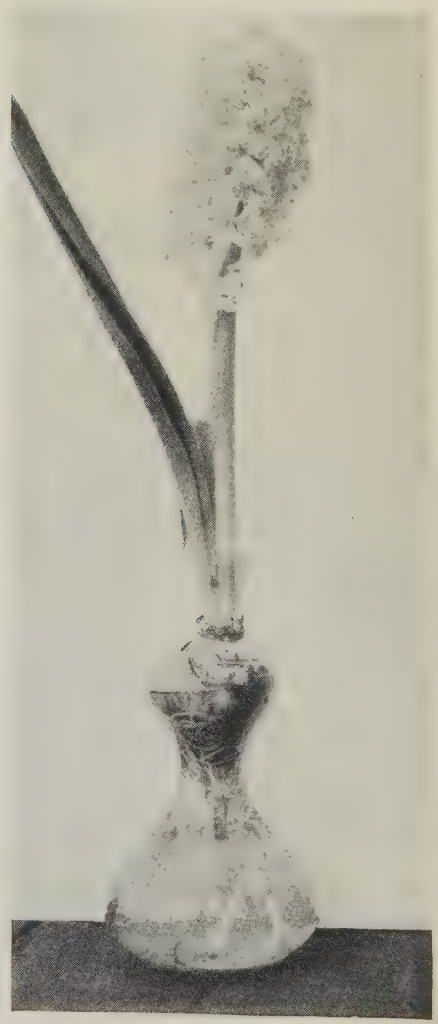
This wrapping paper dunce cap with hole at end makes the bulb strive for the light and develops a tall, strong stalk

response to the bright, warm environment of our home. It is then that we may see the results of our efforts in tangible form for these colorful blooms on the window ledges or in conservatories make a striking contrast with the barren landscape without.

Hyacinths may also be forced by the water culture method and if we contemplate this it is advisable to obtain a hyacinth glass for the purpose. These glasses are tall, vase-like fixtures and are both practical and ornamental since ample space is provided for good root development and the regal beauty of flower when in bloom is enhanced by the elevation which the height of the glass makes possible. As already intimated height is an important feature in the flower's beauty and so we strive to develop a tall, strong stalk upon which the flower is produced. In this respect we aid Nature slightly by "capping" the bulb as the growth begins to emerge. The cap consists merely of a small piece of ordinary wrapping paper rolled into a conical "dunce cap" affair with a small hole at the top, and the gradually developing bloom in "reaching" for the light automatically produces a tall, stout stem. Hyacinth bulbs are large and only one is placed in the neck of the glass which is shaped to accommodate the sphere. The same methods that apply in the forcing of paper white narcissus can be recommended for forcing hyacinths

While the water culture method is employed in forcing the Holland bulbs, most varieties will do better if de-

place as many bulbs as can be easily accommodated by the receptacle on the pebbles. Water is poured into the bowl until the base of the bulbs is just covered and the "planting" is completed, the entire unit being placed away in a cool, dark, well ventilated place for about six weeks. At intervals the progress and growth should be noted, water should be added or changed as required and general care given. To aid in keeping the water fresh it is well to add a small piece of charcoal when the bulbs are placed away. A good root development should be the first consideration and for this reason bulbs of any kind should not be subjected to any great amount of light or warm air characteristic of the interior of our homes. The less the better, for such an environment tends to promote the top growth, minimizing the root development, which invariably results in poorly formed blooms or none at all, for a plant grown under those conditions rarely has vitality enough to produce flowers. The basement, while it is better adapted to this process than the living portion of our homes, is not as well suited to forcing bulbs as one might think. Although we may find portions of the basement that measure up to the temperature requirement it is generally the case that the abundance of fresh air necessary is insufficient. Probably the place best suited to this operation is some dark recess in the garret, especially if there is some small window that may be left open at all times. Six weeks under such conditions, in the semi-darkness of the garret with an abundance of fresh air, will find the root system developed to such an extent that it can easily support and provide plant food for the bloom that will develop in



HYACINTH RESPONDS TO URGE

These bulbs are adapted to the water culture method. Note the hyacinth glass and the root system that develops in it

DAFFODILS ARE ATTRACTIVE
They have always been favorites both for indoor and outdoor culture

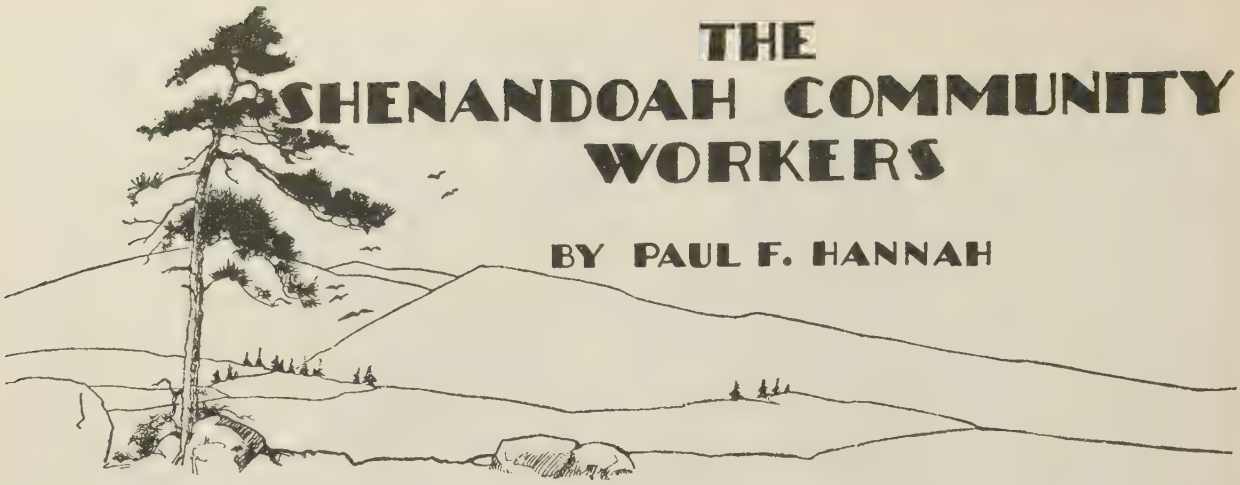
veloped in soil. True, it necessitates a little more effort but the results derived will repay us many times over for the extra precautions. In this connection it is well to know that all bulbs that can be forced can be brought to perfection by the pot culture method while the water culture method is limited to a few, chief of which is the paper white narcissus. Better results can be obtained with hyacinths if planted in soil and the tulips will not respond at all under any other method. Another advantage in favor of this method is the fact that potted bulbs are not subject to tipping over and disposing of their contents upon some particularly fine table linen. There is always the danger of arousing the housewife's wrath when vases or shallow bowls that have a tendency to tip over at the slightest provocation are around, and so, if the man of the house is reading this, it is advisable to "play safe" and abide by the more stable container, the humble earth filled flower pot.

The number of pots used depends, of course, upon the extent of your plans, but irrespective of their number they should be first partly filled with good rich garden soil which, if it does not contain enough plant nutriment, should be thoroughly mixed with a little bone meal. The bulbs themselves should then be set in the soil and spaced well apart so as not to crowd the blooms later on and the balance of the soil sifted about them until the tip just protrudes above the surface. As in all rules there is an exception to this in the case of the tulips. Here it is best to cover the entire bulbs slightly although if the tip is left to protrude above the surface of the soil good results may be forthcoming. The average flower pot will contain about four to five tulip bulbs, three to four hyacinth, four to five daffodil, or about six crocus, depending upon the size of the bulbs which varies slightly.

The bulbs planted and the soil about them moistened, we may again make the choice of two methods. One, the easier, consists merely of placing the potted bulbs away in some dark, cool, airy place, watering occasionally for a period of about six weeks, when, as in the case of the water culture method, the plants are brought into the heated, brighter environment of our window ledges to bloom a short time later. The second, and more painstaking method, consists of digging a trench about eighteen inches to two feet deep and large enough to accommodate the number of pots. This should be done in the shelter of the garage or some similar location to provide ample protection from the severe winter winds. In this pit, place the pots of newly planted bulbs, covering them with a layer of soil over which leaves, straw or some similar material is piled to provide additional protection. Six weeks in this habitat is sufficient to bring the root system to a high stage of development and the pots can be removed from their temporary bed as required, decorated with colorful crêpe paper, and brought gradually into the sunlight.

The varieties mentioned by no means exhaust the possibilities of indoor bulb culture. There are the freesias, amaryllis, scyllas and many others that may be made to bloom during the winter months by following in general the methods outlined above. Bulbs have been favorites with gardeners for centuries. Few flowers have the historic background which they embody, and it is indeed a privilege that these wonderful blooms may be brought to perfection prematurely by such simple methods. If you are not already acquainted with the process try forcing a few bulbs this winter. Drab winter days may be brightened by a dash of color which they impart to the interior of our homes: bold dashing scarlets; warm, glowing yellows; fiery crimsons; deep maroons; delicate pinks and blues; innumerable colors with their "inbetween" combinations liven our dwellings with the spirit of growing things and what little effort is necessary will be well rewarded with blooms during the winter days.

For the convenience of our members we have from time to time published helpful garden bulletins. These are available on request and in return for a two cent stamp. These include: Planting Your Bulbs, No. 31; Gardens Under Glass, No. 32; With the Aid of Lattice, No. 33; Relating Home and Garden, No. 34; Roses, No. 35; Peonies, No. 38; and two Bulletins, Nos. 36 and 40 on Lawns.



THE SHENANDOAH COMMUNITY WORKERS

BY PAUL F. HANNAH

THIS is the story of a little group of families living close against the slopes of the Allegheny Mountains of Virginia, who turned Nature from a relentless enemy into a close friend, and who are filling a need of Nature lovers the nation over.

For nearly three hundred years, the ancestors of this group fought Nature,—ever since the day in the late sixteen hundreds when a little band of "Pennsylvania Dutch" drifted down the Allegheny range to what is now Shenandoah Alum Springs. On the rough hillsides, little adapted to agriculture, they cleared the land for farms, and together fought the "bull" pine that in wave after wave invaded their fields. The tiny streams did not help them any,—they were too small for industry. As generation after generation passed, and life on the unfertile soil became harder, the community grew closer and closer together for mutual help in their struggle against Nature. It kept its individuality; it did not mix with the "valley" folk; it maintained its sturdy spirit despite an increasingly difficult situation.

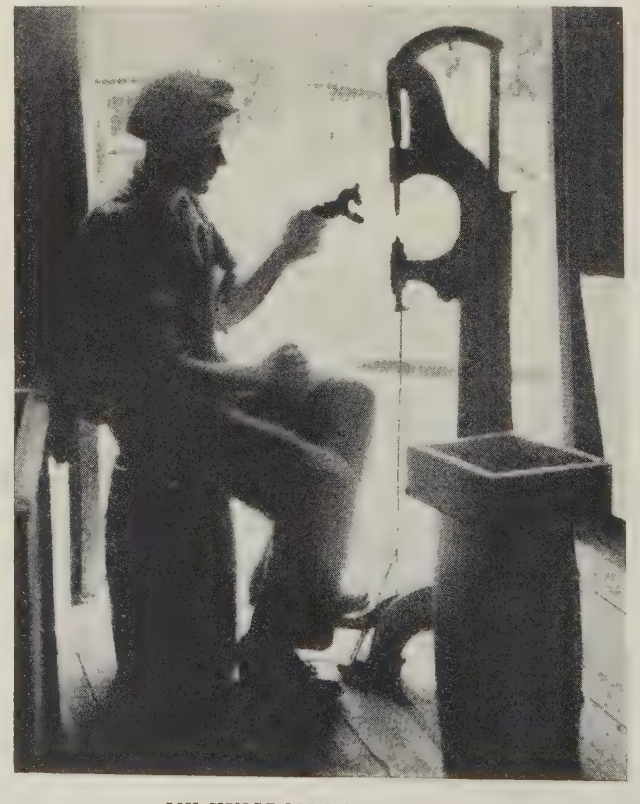
Then, within the past year, this little body of Virginians has decided to change its policy. For three hundred years, running at cross purposes with Nature had brought only poverty. Now they would adapt themselves to her. And in the carrying out of that idea, the organization of the Shenandoah Community Workers was begun.

Expert axe-men,—they had to be to fight the "bull" pine,—they naturally turned to wood, and to the same pine that had overrun their farms, as a means of bettering their condition. Such pine is not adapted to every need; in fact, it is among the most infrequently used of forest growths. How to use it? It was a happy thought that suggested Nature toys, bird houses, bird feeding stands and other products for which Nature lovers have constant need.

So a wood-working shop went up in the midst of the little valley bounded by Supin Lick on the East and the Allegheny peaks on the West. A dry kiln and a paint shop were built. The community, ever close-knit, came even closer to assure success to the enterprise.

Since the goal was not one of profit for a few men, but for the betterment of a hard-working, hitherto handicapped community, outsiders, struck by the unique character of the Nature project, lent a hand.

A Philadelphia manufacturer was one of the first. He was not an outsider, though, for his boyhood associations were with Shenandoah Alum Springs, and he had recently become the owner of several hundred acres in the heart of the community. He remodeled buildings on this tract for the workshops, financed the project and lent a large share of his time and effort to its management.



MY KINGDOM FOR A HORSE

The Community Workers turn out many for the great kingdom of childhood

John Martin, editor and publisher of *John Martin's Book—The Child's Magazine,* contributed a series of his character animal drawings to be cut out in wood, equipped with wheels, and made into Nature toys. The color pictures of the Audubon Society, painted originally by such famous bird artists as R. Bruce Horsfall, Louis Agassiz Fuertes and others, were furnished at small cost by T. Gilbert Pearson, President, to be glued on slabs of pine and cut into simple jig saw puzzles for children. Robert

Dickey, famous over the country for his drawings of dogs, is doing a series to be made into Shenandoah Community Workers toys. R. Bruce Horsfall has contributed a colorful set of bird and butterfly designs that are being made into flower stakes for the garden.

A unique bird feeding stand has been developed by the Workers, very ornamental for the lawn as well as most welcome to the birds. Bird houses are also a featured product.

One has only to visit the Shenandoah Community Workers to note the change that has come over them since they began to work with, rather than against, the natural forces of their environment. They have a new vigor and life; a new pride in what they are doing. Above the hum of saw and planer, in the shop, the workers in different departments shout challenges to each other:—"Have to put in another saw," jibes the painter, "if you can't get them animals to me quicker." "All right, we'll cut them double," comes the answer. New ideas come thick and fast,—and are paid for by the workers themselves out of profits. A personal interest is taken in the manufacture of each animal, and the rows on rows of colorful, artistic creatures that deck the store house shelves reflect in quality that personal touch. You have to see them to understand how realistic a clever design, a piece of board and a few daubs of paint can become.

BIRDS BY THE FLOCK

Surrounded by a bird sanctuary, the Workers draw heavily upon avian inspiration

There is another reason, besides that of available lumber, why Nature articles were chosen by the Shenandoah Community Workers. They live in the heart of one of the most wildly beautiful sections of the South. Civilization has not invaded their slopes; to reach Shenandoah Alum Springs, 1800 feet above the sea, one has to wind along a country road leading to the foothills of the Alleghenies. The 230-acre home of the Shenandoah Community Workers is a bird sanctuary —"The Shenandoah Bird Sanctuary"—and on it are more than 40 varieties of birds. Bob-whites call from every hillside; they literally have to be shooed, like chickens, from the roads as one passes. Grouse and flickers are familiar sights. There are few predatory animals in the neighborhood. And there are no English sparrows or starlings, those sure signs of civilization.

Up along an old logging road near the factory, one can pick up fossils millions of years old,—petrified remains of mollusks and other creatures that became packed into mud during the aeons when the Atlantic had its beaches along the Allegheny ridges, and the Blue Ridge Mountains, if above the surface at all, were mere islands. To visit the Workers is to gain a new impression of Nature. One feels here her supremacy and endless power and age; one wonders how the settlers here managed to withstand her at all during those three hundred years.

The enterprise is still new, and there are many possibilities besides toys, garden stakes and bird accessories. In a year or two, there will probably be an industry in which the women can take part, perhaps canning. They are already famous for their apple-butter, and it may be possible to distribute this to all parts of the country. Wild fruits are abundant, ready for the skilful person who can "put them up."

The Community Workers are using the community idea even in sales. They are seeking to build up a membership interested in their Nature products, to whom new goods may be sent on approval. Purchasers are more than mere buyers; they are contributors, for value received, to the welfare of a unique economic group. For one dollar one can become a "special" member, such membership carrying with it a discount of 10% on all purchases. Anyone can become a "regular" member on request without cost. Regular membership merely implies a friendly interest and insures that the member will be periodically informed of interesting new developments and products.

The Shenandoah Community Workers represent something quite new in economic ideas. There have been co-operative groups before, of course, but few in which the very force that had previously brought hardship was utilized to bring prosperity. Working in the heart of the Alleghenies, in the midst of surroundings almost as natural and untouched and beautiful as they were three hundred years ago, they are striving for a new

(Continued on page 313)

A TORTOISE CONCLAVE
They are not looking for fish—but are protesting their removal from their favorite riffles and rocks

"Turtles" of the West

Concerning A Tortoise That Has Speed

by O. L. Brauer

HAVE you ever sat by a small western stream and watched the water tumble over the rounded pebbles? If you are quite observing, perhaps you have noticed a snake-like head poke up out of the water and look you over, and then quietly disappear. If you are Nature-curious, you perhaps will investigate to find that a pond tortoise has been spying on you and now he crouches among the rocks, his head and legs drawn into the shell. Perhaps he has brothers! And before your search has ended, from one to six more, of different ages, and of sizes varying from that of fifty cent pieces to that of restaurant pies, will be discovered in the same position, shells covered with algae, and almost invisible against the rocks.

THEY'RE OFF
Going places to do things, it seems. Four amphibians race for the water, where they really have speed

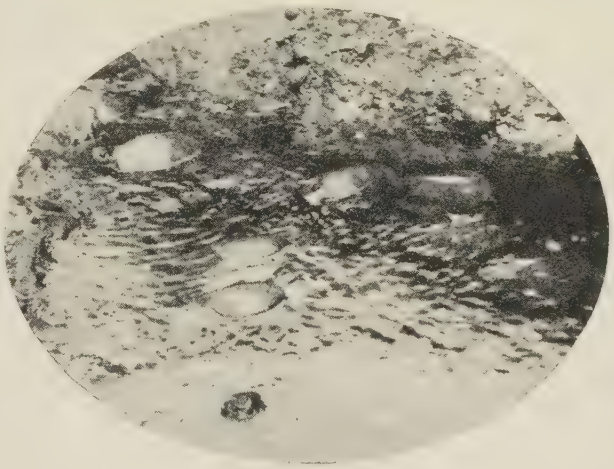
This pond tortoise has not been chummy with man, and not too much is known about him. From what I have observed, however, he leads a country club existence. He spends the forenoon about the deep holes, sometimes basking in the sunshine on an old log or muddy bank, from which he slips into the water at the first sight of danger. At other times he feeds among the rocks in the stream bed, coming to the surface from time to time for air. It is here that you occasionally catch him on your hook when fishing for catfish. Sometimes he lies hidden under a willow root near the bank, betrayed only by a little muddy water oozing out from the side of the root, or else he may be found by a hollow bumping sound as the water throws him against the walls of an undermined bank. About noon he moves out into the shallow riffles to feed among the fresh algae. He seems to eat some of the algae. I have watched one work his way slowly along the slick bed rock and suck up the scum-like moss. He is, however, at least in part a carnivore. Once my father wished to soak out some salt salmon quickly, so hung it in the creek. Next morning, much to his surprise, he found two tortoises helping themselves to it. We often find them feeding on dead fish. The fact that they will bite hooks baited with salmon eggs, grasshoppers, and ant larvae is good evidence that they will eat most anything of that nature. In captivity, the adults will often go on a hunger strike similar to the rattlesnake, but if taken young enough they are willing to eat. In the warm summer weather, the tortoise will continue to feed in the riffles until after dark. Sometimes it digs holes in the gravel probably in search of the larvae of insects, the spawn of fishes, or some aquatic animal that makes a welcome addition to his menu.

The number of tortoises that live in a small stream is quite large. I counted nine dozen in a distance of three miles up one small creek; ten individuals were in one riffle.

Protective coloration is of great assistance to these turtles. I have watched people who were looking for turtles walk by one in plain view without seeing it.

Although their shells are blocked off in distinct hexagonal markings, their similiarity to the rocks in color, shape, and slimy covering makes them all but invisible. Protective coloration is not their only chance for escape. If the water is about two feet deep, they can make a pretty rapid getaway by swimming, and then very seldom take a chance on protective coloration. If the proverbial race between the hare and the tortoise had been staged in the water, the tortoise could have beaten his opponent on even terms.

When the autumn rains bring muddy water and the frost begins to nip the grapevines, the tortoises climb out of the water and burrow under the partially decayed leaves. One winter while burning out some old brush piles we rousted out two of them rudely disturbing their comfortable slumbering.



IN THEIR ELEMENT

They flock by dozens in western rills, but merge so well with their surroundings that they are hard to detect

The eggs of this turtle are a little smaller than a dove's eggs, soft shelled and yellowish like the eggs of other reptiles. The only eggs I have ever been able to find were laid while the tortoise was in captivity. I spent my boyhood along one of the best tortoise streams, yet I never saw a turtle out in the sand. Nor have I seen them digging there. The location of their breeding ground is still a mystery—at least to me.

This tortoise is entirely harmless. No provocation can induce him to bite. He makes fair soup, but in this respect, he is more fortunate than his cousin, the diamond back terrapin. Either he does not taste as good as his cousin or else he is not so well advertised among the wealthy. Relatively few of them are sold on the market. He shows no immediate danger of going the way of his relative, which almost puts him in a class by himself as a fortunate species.

THE PELICAN

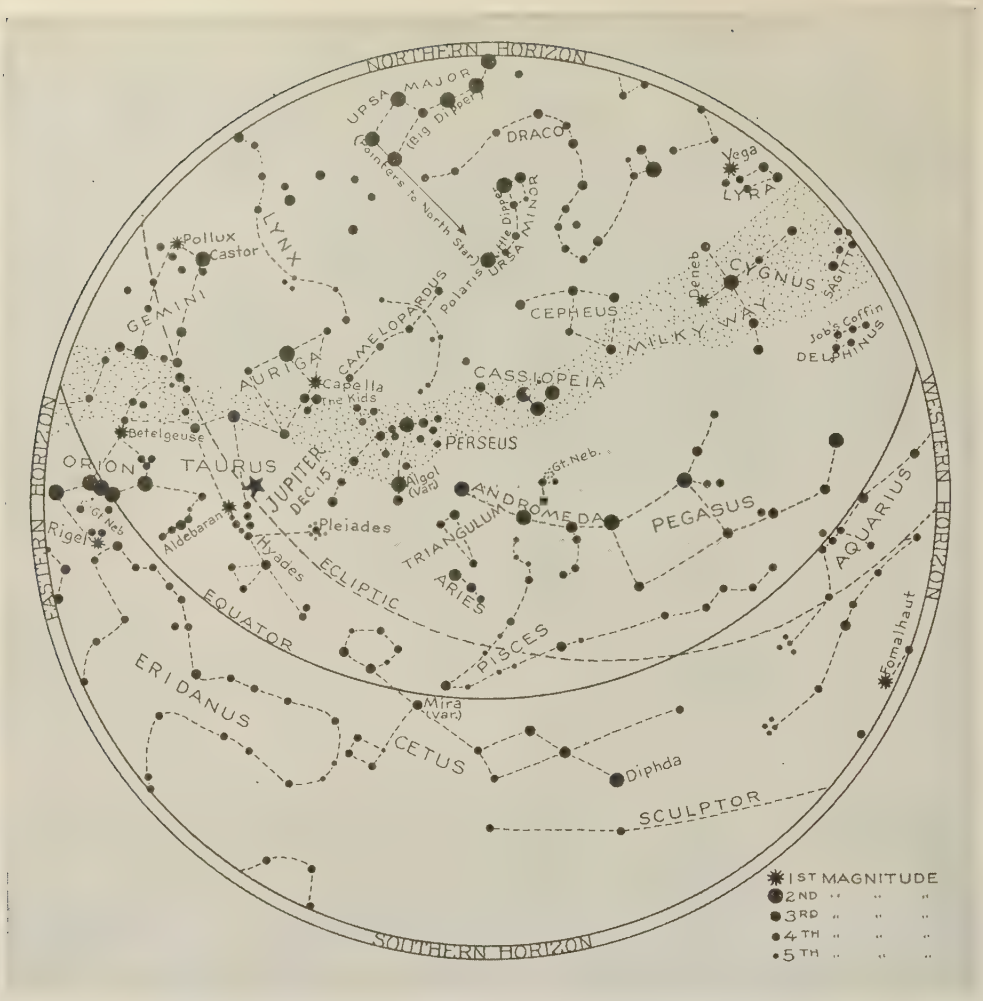
by James N. Miller

FAR DOWN in the mysterious depths of the ocean dwells the pelican, monstrosity among finny monstrosities. Starting out on an ample scale with a short, broad cranium and stupendous jaws, the mysterious forces of Nature which shaped him must have changed their program of contours, for once the bulging stomach was molded, a long and slender nether portion was added—entirely out of harmony with the rest of him.

Just why the pelican should have such a huge mouth and yet such tiny teeth is one of those oceanic puzzles which continually face the scientist. The guess has been presented that possibly the fish, like certain venomous snakes, has salivary glands or digestive fluids strong enough to kill his prey before they damage his insides by sundry vigorous wrigglings. Nor is that possibility remote, for like most of his fellows down in the watery depths, the pelican has a stomach capable of startling distension, enabling him to swallow whole fishes many times his size.

How does the pelican view the world? Simply as an unchanging cold watery blackness in the midst of which he floats suspended. The only light he ever sees is in the form of phosphorescent flashes, such as are produced by the row of little lamps along his sides. He does not know that the sea has a surface for he never rises near it. Nor does he realize that the sea has a bottom or that there are such things as night and day. Fate has decreed that he spend his days in complete ignorance of such.

The pelican was first discovered off our Atlantic coast in 1883, and since then has been found in various places in the Pacific as well as in the Atlantic. How is it that this fish curio can have such an enormous range? Because in the cool depths in which he lives the conditions are the same in the oceans everywhere.



TO USE HOLD OVER THE HEAD WITH TOP TOWARD THE NORTH

This map is for use November 1, 9 p.m., November 15, 8 p.m. and November 30, 7 p.m.

STELLAR YARDSTICKS

How the Cepheids Control the Measurement of Distances

by Isabel M. Lewis

MILLIONS upon millions of miles away, scattered singly in or far beyond the Milky Way, or gathered together with other stars in the globular star clusters and island universes, exist giant or super-giant stars. These are known as Cepheid Variables, which undergo periodic fluctuations of brightness with clock-like regularity. Some of these stars complete a cycle of light change in a few hours, others in a few days or a week, and still others, the most luminous, intrinsically, of all the Cepheids, in a period of one hundred days or more.

The Cepheids are named for the typical star of this class that was first extensively studied, Delta Cephei, a fourth magnitude star in the constellation of Cepheus. They have been more thoroughly studied than any other type of variable star but there is still much to be learned about them. By far the most important and remarkable fact about the Cepheids is that there exists a relationship between their periods, or cycles, of light-change and their true, or intrinsic, luminosity, which is measured by the absolute magnitude or the magnitude a star would have at the standard distance of about thirty-three and a third light years. When the absolute magnitude of a star is known it is possible, simply by a comparison of its apparent and absolute magnitude to determine the distance of the star or that of the star cluster or nebula in which it lies. This is because the apparent magnitude of a star of known intrinsic magnitude would vary inversely as the square of its distance from the earth.

Why a star of this type that completes a cycle of light change in about half a day should be about two and a half times brighter than a first magnitude star at standard distance, or one hundred times brighter than the sun, while one with a period of one hundred days would have

an absolute magnitude of minus six and be about twenty thousand times as bright as the sun is not clearly understood, but this fact makes the Cepheids the most valuable instrument known for gauging star distances. By making use of what is known as the "period-luminosity" curve, which shows this relationship graphically, it is possible to find the distances of objects hundreds of thousands of light years away by a process that is simpler and more rapid than that of finding the distance of an object one hundred or so light years distant by the trigonometric method of measuring the star's parallax with the diameter of the earth's orbit serving as the base-line. The error in the method of finding the distances of far-away island universes is estimated to be about twenty per cent of the distance measured, which is about the same as the per cent of error in finding the distance of near-by stars by the direct measurement of the star's parallax.

The Magellanic clouds in the Southern Hemisphere contain many Cepheid variables, and Miss Leavitt at the Harvard College Observatory discovered nearly 1,800 variables in these clouds and first noted the relationship that existed between the light changes and the periods of such stars.

The cause of the peculiar relation of period to luminosity for these stars still remains unknown. The light changes take place with the precision of clock-work whether the period is a few hours or a hundred days. The range of light change for a Cepheid rarely exceeds one and a half stellar magnitudes and it is in most cases much less. The brightest and the nearest of the Cepheids is the Pole-Star, but its light fluctuations are very small. Most of the Cepheids appear faint because in general they are remote objects. A few, such as Delta Cephei, are of the fourth magnitude. The rise to maximum brightness for a Cepheid is usually much more rapid than its fall. Such a star has been known to increase its brightness by fifty times the light of the sun in two hours and lose all it had gained in the next six hours. The light and also the spectra of the Cepheids change cyclically.

One theory of the cause of the peculiar behavior of the Cepheids has been suggested by Dr. Shapley and worked out mathematically by Professor Eddington. It is that these stars are enormous masses of rapidly contracting or expanding gases, in other words, that they are pulsating stars. As they contract the pressure on the underlying layers of gas increases and this causes an increase in the temperature and brightness of the star. The increase of temperature within the star in turn causes an expansion of the gases with consequent cooling and decrease in brightness. The pulsating theory seems to fit in with the facts that are known regarding the changes that are taking place regularly in the light, spectra and color of these stars. Yet the cause of the pulsations and the reason why a Cepheid of a certain luminosity should have a definite period of light-change is still unexplained.

Another interesting theory to explain the peculiar behavior of the Cepheids is that of Dr. Jeans who considers that these stars may be rotating so rapidly that the effects of gravitation are overcome by the centrifugal force and the star is on the point of dividing into two stars. Oscillations would be set up in that case which would produce variations of light. In the final stages of such a process the star would separate into an eclipsing variable star, the two stars revolving around each other almost in contact.

Cepheids have been found not only crowded closely along the plane of the Milky Way in all directions but also above and below it singly or in such far distant objects as globular star clusters and spiral nebulae, or island universes. They have been observed in about thirty globular clusters, in the Great Andromeda nebula, nearly one million light years distant from the earth, and recently in several other far distant nebula and, as we have said, their presence in these great systems of stars serves to fix the distances of these objects from the earth.

Many of the Cepheids found in the Andromeda nebula are of the long-period type, super-giants of space with periods of light change that range from three to seven weeks with characteristic rapid rise to maximum and low fall to minimum brightness. These light-changes that are seen today, in the Andromeda nebula took place about one million years ago and are now telling the story of the distance and nature of a great universe in the depths of space to a race that was then unborn.

Star-gazers should remember that this is the month for two periodic swarms of meteors to appear, the Andromedes which will appear in greatest numbers in the early evening hours about November 20 to 23, coming from the direction of the constellation of Andromeda in the east; and the Leonids, which will appear the middle of the month in the early morning hours radiating from the direction of The Sickle in Leo. The intensity of the display of the Leonids has been increasing in recent years and they may appear in greater than the average number this year.

Orion is now rising late in the evening. The Hyades and Pleiades are well in view in the east. Two brilliant stars differing greatly in color now adorn the northeastern and northwestern sky respectively. Capella, golden-yellow in color, is now coming well into view as the diamond-like Vega approaches the northwestern horizon.

Cygnus and Aquila are still visible in the west and Fomalhaut is conspicuous in the southwest. Andromeda and the Great Square in Pegasus are now just south of the zenith and Cassiopeia is on the meridian due north. Cepheus will be found next to Cassiopeia on the west and the Big Dipper now rests nearly on the northern horizon below the pole.

Among the planets Jupiter is now in fine position for observation throughout the night. It will be found in Taurus, a little to the northeast of Aldebaran. Both Mercury and Mars will be too close to the sun to be seen this month. Saturn sets about two hours after the sun the middle of the month. It is in Sagittarius and too near the sun to be well observed. Venus is a fine morning star, rising about two hours before the sun on November fifteenth. This is a good month for star-gazers.

THE LAST CHANCE

But Fifty Days Remain In Which to Vote

IS THIS FLOWER THE NATION'S CHOICE?

The lead it has gained is large, but proponents of other flowers say it may be overcome before December 1, when the polls close

Do you wish to have had a share in the election of the National Flower of the United States? Do you want to help your favorite flower gain a lasting place in the nation's memory? Then vote, either by letter or the ballot printed below. Now but fifty days remain in the American Nature Association National Flower Poll.

The contest is by no means over, despite the fact that the wild rose is leading by nearly 200,000 votes over its nearest competitor, the columbine. At the time this was written, the fall campaign was hardly under way, and several hundred thousand votes are expected before the polls close on December 1. The wild rose ran up its plurality during the spring campaign, and another candidate may still sweep the field in a like manner. Do not refrain from voting because the issue seems to have been settled. Nothing is ever decided in an election until the last ballot is in.

To adults, whether in business organizations, social clubs or at home; to children in every section of the land, there is but one request—vote! And at once.

The standing of the candidates at time of going to press was as follows: wild rose, 342,209; columbine, 146,291; violet, 79,167; goldenrod, 64,366; phlox, 29,358; American Beauty Rose, 12,297; daisy, 10,869; dogwood, 9,742; mountain laurel, 8,786; and a total of 18,537 votes scattered among thirty minor contestants. The total, which represents every state and nearly every city and town, has reached 721,622 ballots.

The greatest gains during the past month have been made by the columbine, and such supporters as Mrs. Joseph C. Elliott of New Jersey, feel confident that this demure little flower will finally overtop the rose. The present leader has been coasting for some time, seemingly assured of the final outcome. Both the violet and goldenrod are gaining steadily.

The states casting the greatest number of votes have been Pennsylvania, with 67,695; Ohio, with 65,441; Wisconsin, 47-128; Washington, 45,665 and New York, 39,260. In each of these, strong organizations have taken charge of the campaign, reaching into every community.

Other states have been rather backward about voting, and unless they actively participate in the remaining days, will not secure their proper representation. The smallest returns have been received from Kentucky, New Mexico, South Carolina, Nevada and Delaware.

Whether the wild rose, columbine, violet or goldenrod is chosen, the American people will have, it is generally felt, a worthy symbol. Fear has been expressed of duplicating England's flower, the rose, but it is pointed out that her rose is the cultivated variety, while the American flower is wild. The columbine is one of the most beautiful blooms growing on the continent, and is as decorative in the home as on the hillside. Both the goldenrod and violet have long been favorites, dear to the heart of the public.

So bring on your votes. Let the choice be intelligent, and not based on emotionalism, but on a careful study of the flower's characteristics in relation to the ideal qualifications a national symbol should possess.

Secure the ballots of your friends; if a member of clubs, whether business or social groups, make certain that all the members of these have voted. Additional ballots may be secured from the American Nature Association, and likewise information on the qualifications of the different candidates will be distributed on request. Help bring out a record vote, so that when the contest is finally over, the candidate raised to national honors will represent, in every aspect, the choice of the people.

America's national flower will soon be established, to take its place among the famous of flowerdom—the rose of England, the lily of France, the edelweiss of Switzerland and the rest. Which shall it be—the rose, the goldenrod, the columbine or the violet? The answer is still unknown. It lies in your ballot.

NATURE MAGAZINE
NATIONAL FLOWER POLL

Please mark and send this ballot to National Flower Editor, NATURE MAGAZINE, *1214 16th Street, N. W., Washington, D. C. before December 1, 1929.*

My choice of flower to be designated as National Flower is .....

* * * *

IF A CLUB OR SCHOOL, PLEASE INDICATE BELOW FLOWERS RECEIVING FIRST, SECOND, AND THIRD LARGEST NUMBER OF VOTES

First Place ..... **No. Votes** .....

Second Place ..... **No. Votes** .....

Third Place ..... **No. Votes** .....

(Signature or name of school or club) .....

.....

(City and State) .....

Helps and Hints

FOR HOME AND GARDEN

WHILE not much in the way of flowering beauty still lingers in most northern state gardens, the garden should not now be dismissed from mind. It is not too late even in early November in most climates to get iris, tulips, narcissi, peonies and other spring-flowering bulbs into the ground. As a matter of fact, if you have some sturdy growths of perennials, they can be planted in the perennial border with safety, although this is no time to plant anything from the seed frame.

* * *

So far as beautifying your home grounds with new shrubs goes, autumn is the favored time of year to do it. After a freeze has killed the leaves of the shrub and it has gone to sleep for the winter, and before the ground has frozen hard, these shrubs can be gotten into the ground. A heavy pruning is advisable. Get your shrubs from a reliable dealer, however, where you can be sure of thrifty stock with root systems that will care for it during the first winter in your yard.

* * *

Elsewhere in this issue Mr. C. Frank Brockman, who is, incidentally, the Park Naturalist at Mt. Rainier National Park, writes of growing bulbs indoors in the winter. As many know, this is a fascinating winter sport for the flower lover and pays ample dividends in flower beauty. There are a number of bulb dealers who use the pages of Nature Magazine for their advertising and they are reliable firms.

* * *

It will not be long now before Christmas will be with us once more and this year will undoubtedly see an even greater increase in the use of living Christmas trees. Evergreen shrubs around the home lend themselves to attractive display and lighting during the holidays and may be planted at this time. More and more homes are adopting the plan of having a living tree in the home, planted in a tub and decorated as are the dead trees which soon begin shedding their needles. After the tree has served its Christmas function it finds a permanent place in the home grounds. See your nurseryman about a living Christmas tree for this year.

* * *

Mention of this activity at Christmas time suggests mention of the fine work that has been done during the past year by Mrs. Warder Irwin Higgins of Butte, Montana, as chairman of the Committee on Gardens of the General Federation of Women's Clubs. Throughout the year she has gotten out to the club leaders material of both inspirational and practical value which has notably aided the garden movement. Mrs. Higgins hopes particularly that the various clubs will add to the purely garden activity the subject of Art in the Home and Garden to the end that domestic and landscape architecture and interior decoration may be better harmonized.

(Continued on page 309)

Last Chance!

to plant Schling Quality Bulbs this Fall

Order them *now!* Tip-Top bulbs at rock-bottom prices. For example—

100 Darwin Tulips $4.00

Choicest, first size bulbs, sure to bloom. Schling's special mixture of ten of the finest named varieties—*not the ordinary field grown mixture. A $6.00 value for $4.00 or, if you prefer, 50 bulbs for $2.50.*

SIX SPLENDID COLLECTIONS

100 **Single Early Tulips**—10 named varieties. Bloom April and May	$7.00
100 **Double Early Tulips**—in 10 named varieties	8.00
100 **Darwin Tulips**—in 10 named varieties. Immense flowers, May and June	6.00
100 **Cottage Tulips**—in 10 named varieties. Grandmother's tulips more beautiful than ever. May and June	6.00
100 **Breeder or Art Tulips**—5 named varieties. Wonderful shades of bronze, orange, buff and apricot. May and June	8.00
100 **Parrot or Orchid Tulips**—in 5 named varieties	7.00

ALSO THESE LOVELY HERALDS OF SPRING

500 Bulbs—a $23.50 value—$16

100 Crocus in 4 named varieties	$5.00
100 Scilla Sibirica (Blue Squills)	5.50
100 Giant Snowdrops	4.50
100 Blue Grape Hyacinths	4.50
100 Chionodoxa (Glory of the Snow)	4.00

Virginia Grown Daffodils and Narcissi for Naturalizing and Lawn Planting

100 for $8.50 **1000 for $80.00**

OUR Old Dominion Collection in choicest mixture of airy and medium Trumpets, short cupped and lovely Poet's varieties. All first quality bulbs grown in Virginia where their culture has flourished since Colonial days. These bulbs being native, are fully acclimatized and none better can be grown anywhere.

Our new **Bulb Book**—lists of choicest bulbs for in or outdoor planting—free on request.

MAX SCHLING SEEDSMEN, INC. **Schling's Bulbs** 618 Madison Avenue, North New York City

GLORIOUS MAY FLOWERING TULIPS *for Fall Planting*

EXTRA QUALITY FLOWER BULBS

from Bassi Frères

SPECIAL OFFER

DARWIN TULIPS

for immediate delivery. Grand assortment of named sorts.

100 for $3.25 1000 for $30.00

All top size bulbs sure to bloom and produce magnificent flowers.

DARWIN TULIPS

		Doz.	100
Baron de la Tonnaye	Pink	.60	$4.25
Clara Butt	Pink	.60	4.25
Farncombe Sanders	Red	.60	4.25
King Harold	Deep Red	.70	5.50
Pride of Haarlem	Rose	.60	4.75
Rev. Ewbank	Lilac	.60	4.50
The Sultan	Black	.55	4.00
Centenaire	Rich Violet Rose	.60	4.75
Dream	Heliotrope	.70	5.00
Flamingo	Shell Pink	.80	6.00
Loveliness	Rosy Carmine	.65	5.00
Mrs. Krelage	Rose Pink	.65	4.50
Mrs. Potter Palmer	Purple	.75	$5.50
Bartigon	Scarlet	.60	4.25
Princess Elizabeth	Pink	.60	4.75
Bouton D'Or (Cottage)	Rich Yellow	.65	4.75
Gesneriana Major (Cottage)	Crimson	.65	4.75
La Mervielle (Cottage)	Flame	.70	5.00
Inglecombe (Cottage)	Yellow	.70	5.00
Orange King (Cottage)	Scarlet	.65	4.75
Orange Beauty (Cottage)	Orange	.65	4.75
Fairy (Breeder)	Reddish Mahogany	.70	5.50
Bronze Queen (Breeder)		.70	$5.50

An Attractive Saving.—10% may be deducted from total when ordering 6 varieties in dozen lots or more. 25 and 50 of each at the 100 rate.

Many other choice varieties listed in our 1929 Bulb and Plant Catalog mailed free. Ask for it.

SPRING HARBINGERS

Delightful little gems for edgings, Rock Gardens, etc. Chionodoxa (Glory of the Snow), Eranthis (Winter Aconite), Grape Hyacinths (Heavenly Blue), Snowdrops (Single), Scilla Campanulata (Blue)
Dozen 40c, 100 for $3.00.
Crocus Mixed: 100 for $3.00, 1000 for $27.00.

Bassi Frères Inc. de Paris

SEEDSMEN, NURSERYMEN
478 Main Street
NEW ROCHELLE, N. Y.
Phone New Rochelle 8700

TWENTY-FOUR BEAUTIFUL AND DISTINCTIVE CHRISTMAS CARDS for ONE DOLLAR

See Announcement on Page 260

WHO ARE THE MARTINS?

They Run Things in Syracuse, N. Y.

by J. R. Simmons

THE MARTIN HOUSE

Below, the City Hall forms the background. The Erie Canal once flowed down this street

"WHO in thunder are the Martins?" That was what the Division Engineer, at the Division of Canals, in Syracuse, New York, wanted to know, and in no uncertain terms he demanded the answer from the property superintendent. There it was, in black and white—"For painting the Martin House—$12.50"—the property superintendent had always been satisfactory before, and no irregularities had been performed, but now—"who in thunder were the Martins?"

And the stentorian voice of the Division Engineer, that went through doors like Sherman through Georgia, caused rather a large amount of talk around headquarters regarding people "on the carpet".

The Superintendent explained. The Division Engineer calmed down. And the Martins became a recognized group.

"Years ago when the old Erie Canal passed through the center of the city of Syracuse, even as the railroad does today," the property super elucidated, "the Martin house was built and mounted on the top of a twenty-five-foot pole in the shadow of the Weighlock building. The house is only about two and one-half feet by three and one-half feet, but it contains no less than thirty comfortable apartments, small, to be sure, but big enough for martins. These apartments were occupied many years ago by a martin colony, and the descendents of these early tenants have been occupying the ancestral mansion ever since.

"Life among the martins was ideal during the many years when the old Erie Canal was in use; and even after the new barge canal was built and the boats sent over the new course through Oneida Lake, there was water in the old Erie bed, and ample food in the form of insects of all kinds continued to be available over the surface of the Big Ditch.

"In recent years all this has been changed. The old Erie Canal through Syracuse has been filled and made into a paved street. The martin house still clings to its pole but appears like a remnant of some dim past, surrounded as it is by busy thoroughfares and new buildings, and nothing in the way of water but a small fountain fed from the city mains replaces the canal.

"But the martins, bless their hearts, are as happy, apparently, as martins have always been. And they chortle and dip and glide, and mate and establish homes and increase and multiply, all in spite of the drastic changes that have been wrought by the people of the State of New York and of the city of Syracuse.

"And," said the property superintendent, "I considered it my duty to paint the martin house in justice to the tenants. There'll be at least five or six families this season. I've given them Skaneateles water when they'd have much preferred the old Canal; and they haven't raised an objection to the increased rent and loss of their ancient privileges, though goodness knows they've long since had reason to pack up and leave. Twelve-fifty is correct. It's the cost of the improvements, such as they are, to the Martin House. And it's one of the best investments the department has made this year." The boss nodded; the bill was o. k'd.

THE DECEMBER FLORIDA ISSUE

Don't forget that four copies of the special Florida issue of Nature Magazine coming next month will be sent to any four addresses for one dollar. Order early before the edition is exhausted.

(Continued from page 307)

Rhododendrons
Kalmias
Azaleas

Collected and Nursery Grown

Leading in quality and service for twenty-six years

OUR GENERAL CATALOGUE mailed on request to points east of the Mississippi River.

LaBars' Rhododendron Nursery

1104 Bryant Street Stroudsburg, Pa.

Nursery located 2,000 feet from Lackawanna Trail, Pa. Route 2: U. S. Route 611. Visitors welcome at any time.

Sterling Evergreens

Sterling Hardy Materials that form the basis of landscape work for all homes. Give date preferred for shipping.

RHODOS. LEUCOTHOE
KALMIAS HEMLOCK
HOLLY RED CEDAR
BOXWOOD WHITE PINE

and other handsome trees and shrubs. Samples of those above named—sturdy, bushy little trees, 1 to 1½ ft., B. & B. by express your expense, 1 of each, $7.

The 5 Broad Leaves for $5; the 3 Conifers, $2.50.

SEEDLINGS FROM BEDS, 6 to 10 in., packed in bundles of 10, Broad leaves $2.50; Conifers, $1.50.

Price list on request

HARDY EVERGREEN GARDENS

Marion - - North Carolina

FASHIONABLE
MODERNISTIC
UNIQUE

✓ CACTUS

As an introduction to our service, we offer

ROOTED OPUNTAE

Plants at 60¢ each—3 different for $1.50. Try us.

Booklet Cactus Culture 15¢

THE HOME NOVELTIES CO. . Cedar Knolls, N. J.

FALL BARGAINS

Write for Cole's special Fall Book containing twenty pages in color describing *Peonies—Dutch Bulbs*—also *Phlox, Gorneh* and *Japanese Iris, Oriental Poppies,* field grown *Roses,* that are potted and ready to bloom, etc.

This free book contains *big values* on thrifty stock. We grow "Everything that's good and hardy".

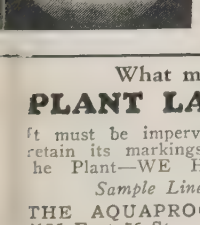
THE COLE NURSERY CO.
Painesville, Box 27, Ohio

WESTERN WILD FLOWER BULBS

CALOCHORTUS—Resembles a full-bloomed dwarf Tulip. Exquisite shades of Rich golden yellow, rosy-pink and lilac. Some beautifully marked with bronze or deep claret. Hardy when mulched well with leaves. Fine for Rock-gardens. Choicest, flowering size bulbs—50 for $2.25—100 for $4.00 Postpaid.

12 each ALLIUM, BRODIAEA, CALOCHORTUS, ERYTHRONIUM, FRITILLARIA and TRILLIUM, a complete WILD FLOWER GARDEN, 72 strong, Nursery Grown bulbs for $4.25 Postpaid; Half collection $2.25 Ppd.

GORDON AINSLEY, CAMPBELL, CALIFORNIA



Desert Cacti Special

4 blooming size plants mixed $1.00. 10 blooming size plants mixed $2.00. 5 blooming size plants mixed and 5 inch Mexican hand painted bowl $2.00. Miniature bowl and baby cacti FREE with every order. Best holiday gift, everlasting. Postpaid.

BORDER CACTI CO.
Box 1259 El Paso, Texas

What makes a good

PLANT LABEL GOOD?

It must be impervious to moisture, must retain its markings, and must not girdle the Plant—WE HAVE IT.

Sample Line for the Asking

THE AQUAPROOF PRODUCTS CO.
2175 East 76 St. Cleveland, Ohio

Meeting in Toronto, Canada, in August, the National Association of Gardeners considered and acted upon the question of national plant registration. A joint committee composed of individuals representing a wide range of horticultural interests studied the issue. The joint committee consisted of: H. Ernest Downer, chairman, Montague Free, Alex MacLeod, F. L. Balogh, representing the National Association of Gardeners; A. C. Hottes, Society of American Florists; J. H. Nicolas, Société Nationale d'Horticulture de France and American Rose Society; Leonard Barron, American Rose Society and Horticultural Society of New York; A. M. Augustine, American Association of Nurserymen; C. H. Connors, American Society for Horticultural Science, New Jersey State Horticultural Society, New Jersey Experiment Station; John Scheepers, Horticultural Society of New York and National Association of Gardeners.

The result was the adoption of a number of articles bearing on plant registration and of interest to all seriously concerned with gardens. The articles approved were:

1. That thirteen to fifteen shall be chosen for the executive board, one of whom shall be a member of the National Association of Gardeners, and five shall constitute a quorum.

2. That subscriptions shall be solicited to cover the expenses of the first year. Societies represented on the committee to be assessed a fixed sum or percentage thereafter.

3. That the National Association of Gardeners' headquarters shall be used as a temporary office and that a librarian-secretary shall be employed temporarily.

4. That registration shall be through existing plant societies, whenever possible, and that they shall report to the office of the national horticultural committee, as the coordinating organization; miscellaneous material to be registered by special committees.

5. That, as uniform terminology is a desideratum, existing societies shall be approached with regard to their willingness to conform with the practice of using the word registration to indicate merely the recording of a name, hitherto unused.

6. That registrations shall be announced in the Gardeners' Chronicle as the official organ of the National Association of Gardeners, indicating this project, and also in other publications.

HOLLY FOR ALL TIME

(Continued from page 296)

and the eastern coast, then the Middle West, and so on, are filled so that the holly will arrive simultaneously and seasonably everywhere. For two months it is a busy time on holly ranches, with harvesting keeping step with the orders from distant points and special graders and wreathmakers taking care of preparing the product for the Christmas user. And once the western-grown English holly has been used its annual popularity is assured.

Thus does the holly industry, created out of an insistent demand, afford the farmer an opportunity to diversify his crop and put some spare acres to work for generations to come. Thus also does its upbuilding offer a distinct aid toward checking the eventual extinction of our native holly.

With Loving Care
We Tuck Them
Away
for the Winter

THEY'VE had a glorious farewell party—these flowers of ours . . . riots in color . . . dressed in their dazzling tints and shades . . . dancing around in the autumn breezes . . . gladdening our hearts with their pretty faces . . .

But quite soon now their little heads will nod in slumber . . . and then we must do *our* part.

Both the tubers we dig, and the perennials and shrubs that are at home in the earth all winter need a *little* winter protection. Tubers and bulbs should be packed away *carefully* in well insulated containers to protect them against dampness or excessive heat or cold, so they will not shrivel or suffer other injuries. We've a special pamphlet illustrating and telling about packing bulbs and tubers that you may have if you wish.

Then, every gardener also has an investment in permanent plants which will suffer *certain loss* unless protection is afforded against winter killing. The yearly loss due to winter killing is enormous, yet it may all be avoided simply by using a winter mulch of GPM (Granulated Peat Moss) spread around the roots.

TRADE MARK G P M
PEAT MOSS

Complete information

will gladly be furnished on request. Inquiries regarding specific plants will receive personal attention. Sample (trial) bale $1.50 postpaid. Large, 20-bushel bale, sufficient to cover 300 sq. ft. one inch deep $4. f. o. b. New York.

Atkins & Durbrow, Inc.

E-25 BURLING SLIP

New York, N. Y.

Keep ferns lovely all winter long

Use Plantabbs. Amazing new discovery! Small, white, odorless tablets more powerful than finest fertilizer or manure. One tablet to pot each week makes ferns, geraniums, begonias, all potted plants grow like magic.

No Plantabbs

FREE BOOK—32 pages, interesting, highly illustrated, tells how to raise and care for all potted plants, FREE with order. Large package Plantabbs, full winter supply, $1.00 postpaid. Guaranteed to improve your plants or money returned.

Plantabbs Used

PLANTABBS CORP.
2103 Court Square Bldg. Baltimore, Md.

SPECIAL OFFER for FALL PLANTING

Japanese Roseflowering Cherries in complete assortment:

5 2-yr. trees, prepaid to your address, $7.50

10 2-yr. trees, prepaid to your address, $12.50

(East of Rocky Mountains)

Illustrated catalog FREE

A. E. WOHLERT — The GARDEN NURSERIES Narberth Pa.

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OF NARBERTH, PENNA.
927 MONTGOMERY AVE.

TEN CACTI

Blooming size — All different

Postpaid for $2.50

Table garden size $2.00

JAMES ALLAN

Mountain Park — New Mexico

COLONIAL Sun Dial

Ideal gift for a garden-loving friend. Cast metal, 11" diam. 8 lbs. Gray & gold, or bronze lacquer. Motto *"Time takes all but memories". Postpaid* $3.50.

CRAFT DEPT.

Write for gift catalog showing bird feeders, bird houses, garden ornaments, castings for home decoration.

A. H. PATCH, INC.
since 1885
Clarksville, Tenn.

Roses of New Castle

is the title of our autumn catalog, offering these world-famous roses, also hardy perennials, shrubs, tulips, hyacinths, etc. Everything for fall planting. Full cultural instructions given. Write today. The book is *free*.

Heller Bros. Co., Box 1010, New Castle, Indiana

BEAUTIFY your home with a fine Broad Leaf Flowering Evergreen Shrub. Beautiful Rhododendron, Max. and Mountain Laurel 2 to 4 ft.,—25 for $5. or 100 for $18. Clumps (fine specimens, having 6 to 18 branches) 2 to 3 ft.—10 for $7.—or 25 for $15. Seedlings 12 to 24 inches $8. per 100. Hemlocks 2 to 4 ft.,—25 for $5. Cash with order.

Doeville Collection Co. — **Doeville, Tenn.**

Learn to be a— LANDSCAPE ARCHITECT *At Home—By Mail*

Big fees; pleasant healthful work; a dignified, uncrowded profession offering remarkable opportunities. Immediate income possible, many students more than pay for course from fees earned while studying. Graduates are earning $50 to $200 a week. The first step toward success is to write today for details.

AMERICAN LANDSCAPE SCHOOL
Combined with National School of Landscape Design
21 Plymouth Bldg., Des Moines, Ia.

THE ETERNAL RAINBOW

(Continued from page 272)

necessary to make Rainbow Bridge beautiful. Until that day it had been awe inspiring but ponderous. Today it inspires more awe than ever, yet it is as graceful as the bow of the heavens, for which it has been named.

Although the bridge was discovered by white men in 1909, when I visited it first in 1925, I was still among the first 500. Upon my return in 1927, Bob and Fran found themselves fairly near the end of the second 500. The reason for this change is not far to seek. Until 1925 it was necessary to employ John Wetherill, Zeke Johnson, or some other good guide and make a rather expensive pack train trip of nearly two weeks to get a look at the eternal rainbow.

However, in 1924, Hubert and S. I. Richardson, with their business partner, Stanton K. Borum, conceived the idea of laying out an automobile road to a spot on Navajo Mountain about eleven trail miles from the bridge. Two Piute Indians were employed to select the route, and the three men financed the building singlehanded, although nearly sixty miles of new road had to be made passable.

As it climbs and tumbles and wiggles its way around White Mesa and down a knife-edge ridge between Navajo and Piute Canyons, that road is not one for timid drivers or faint-hearted passengers. I have traversed it four times and can attest to the fact that it is both passable and safe, but I hasten to state that in rainy weather you proceed at your own risk.

The road has its northern terminus at Rainbow Lodge where the Richardsons maintain a trading post and hotel equipped with excellent guides and the very best of saddle mules and pack animals.

On the side of Navajo Mountain opposite Rainbow Lodge, John Wetherill and his son Ben have also established a trading post from which pack trains make trips to the bridge and through the surrounding country. Of course the more adventurous and affluent souls may still take the eleven-day trip from Kayenta, also with the Wetherills, or a two weeks' trip from Blanding, Utah, with Zeke Johnson and see all the other big bridges en route.

It is also possible to reach the bridge by taking boats from Moab or Green River, Utah, to Bridge Canyon and then walking about six miles to the arch. This has been done a number of times, but a good guide is absolutely necessary.

For automobile tourists the best route is from Flagstaff, Arizona, to Tuba City, then to Red Lakes Trading Post, through the Elephant's Feet, keeping the lefthand road at the forks a few miles beyond and following the Rainbow Trail to Navajo Mountain. The distance from Flagstaff is about 170 miles, but don't count on a trip of less than fifteen hours because the roads are not boulevards.

Twice I have been to the Rainbow. Each time I have gone afoot, although I must admit that this method affords more punishment than pleasure. Yet when I go again, and I shall,—it will be afoot. Yes, twice I have been to the foot of the Rainbow and each time I have carried away a pot of gold—a pot of golden memories. May you be as fortunate!

FEED the BIRDS

Use the **Packard Automatic Feeder.**

Keeps food dry, avoids waste, holds a quart, weighs (packed) 3 pounds, and costs $1 and **postage.** Why pay more?

Special Mixture Bird Food

Balanced ration. Nothing else like it: nothing else so good. 10 pounds, $2 and postage.

Everything For Wild Birds Catalogue Free

WINTHROP PACKARD
1433 Washington Street Canton, Mass.

BIRD LOVERS Free

50-Page Bird Book in Colors "Canaries for Pleasure and Profit"

Gives expert professional advice on breeding, rearing, training, feeding and care of canaries. Keep your birds in song. Sent free together with liberal samples of West's Quality Bird Foods on receipt of 10 cents in stamps or coin to cover mailing cost.

West's Bird Foods are sold at all good stores

Magnesia Products Co., 1586 Hubbard St. Milwaukee, Wis.

BIRD FILLING STATIONS

Patented July 13, 1926

Feed the birds *NOW and have* them with you all winter.

—AUTOMATIC— IMPROVED

Suet always clean and accessible to last particle.

For smallest home or largest estate. Every home should have several.

POSTAGE PAID

No. 1, price $1.50 No. 1 to hang from tree or bracket.

No. 2, price $1.25 For window casings, porch columns, etc.

LEWIS P. KELLY, R. F. D. 4, Dept. N, Peoria, Ill.

SAVE THE SONG BIRDS

With My **2-in-1 Bird Feeders**

A Feeder in Winter— Wren House in Summer $2.50 Postpaid.

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(See August number Nature Magazine Page 118.)

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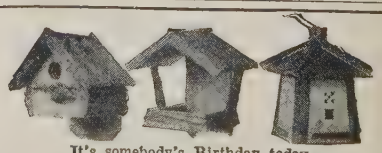

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IN the October issue there was a report on the success of the Nature Magazine trips to Glacier National Park and a statement that this success made mandatory the continuation and extension of this activity. As a result plans are being matured for a wider field for the year 1930, and several distinctly unique expeditions are being worked out in detail. The basic principle of small parties, personally escorted by a member of our Washington staff and by an experienced Nature guide, will be maintained in every instance. Complete announcement of plans for next year will be made shortly after the first of the year, and for those who make their vacation plans early they will be worth waiting for.

* * *

Winter vacations and holiday trips are now approaching and there are varied possibilities on both land and water. The December issue of Nature Magazine will be the Florida number and a sort of Nature handbook to that state for our readers. This department is at the service of any and all who plan to escape days or weeks of snow for sunny Florida beaches, and will be glad to put information about train services and resorts in the hands of its readers.

* * *

For the air-minded a new ten-hour service from New York to Miami is being inaugurated this winter by the Eastern Air Express. This company will fly luxurious six-passenger Bellanca planes on a regular schedule with stops at Norfolk, Virginia, and Savannah, Georgia, for refueling. There will be other ports of call along the route in response to demand and a spur line will fly from Jacksonville to Tampa.

* * *

This is not the only vacation flying that will be popular, however, with the inauguration of the Pennsylvania Railroad's air and rail service to the Pacific Coast. A quick and thoroughly delightful way to cross the country.

* * *

For those who prefer a more leisurely western trip in the winter, the southern routes of the Santa Fé and Union Pacific offer trips of great interest. Stops made along the route, with side trips or merely stopovers, take one into various parts of the amazing and fascinating Southwest. This department will be glad to cooperate in working out a suggested winter vacation trip to California by way of the Southwest.

* * *

The Hamburg-American Line has announced two Christmas excursions to Europe on their popular cabin class ships *Cleveland* and *St. Louis*. These will be personally-conducted cruises sailing from New York December 10 and 12. They will reach European points in ample time for Christmas festivals.

Native South Africa

A native witch doctor giving a "Treatment"

SOUTH AFRICA is one of the most modern and progressive sections of the world . . . luxurious hotels and railroads, delightful golf and yachting clubs, superb motor roads, and all the comforts and conveniences of modern civilization . . .

But there is also the immensely picturesque native side of South Africa, so alluring to the tourist . . . the quaint kraal life . . . wild war dances . . . weird age-old tribal customs . . . the dignified Zulu chief and his retinue of dusky wives . . . stalwart warriors with their spears, shields, and knobkerries . . . the primitive musical instruments . . . the women's fantastic headdresses . . . the superstitious mummery of the witch doctor.

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NATURE NEWS AND Views

The Billboard Battle

"There is a new struggle in the Shenandoah Valley this summer that hits hard at the visitor. The battle is between beauty —the natural beauty of Virginia—and Billboards. And unless reenforcements come to the aid of beauty, the billboards will capture the day."

This is the introductory paragraph of a letter written to Governor Byrd of Virginia by Mr. Arthur Newton Pack, president of the American Nature Association. The letter arose out of a trip of more than 250 miles through a section conceded to be outstanding in its scenic beauty. Indeed, one part of it seeks National Park status. The letter specified the numbers of the signs and their general vicinity and is supported by a detailed survey which was made on this trip,—which, incidentally, was not made for the purpose of surveying the billboard situation originally but turned out so because of the continual intrusion of this glaring blight.

This letter inspired editorial comment in the press, both in the State of Virginia and without. The *Times-Dispatch* of Richmond comments sadly on the situation saying that "this subject has long been a sore one to thoughtful Virginians who love their State and wish to keep it forever beautiful. . . . Such signs create a distaste for the service or wares advertised, yet it would be difficult to persuade many advertisers that they are not worth paying for. . . . If the farmer wishes to rent some of his property to a billboard advertiser, there is nothing to prevent him from doing so. . . . Perhaps in time his native pride will rid the State of many of these signs that detract so much from its natural beauty." The Roanoke *Times* avers that "the 'buy-way' nuisance, as Mr. Pack terms it, is well nigh universal. Virginia is only one of many States afflicted with the blight."

The Wheeling, West Virginia, *Intelligencer,* is emphatic in its approval of the protest and points to its own hillsides, saying, "There is doubtless a proper place for billboards, on business buildings, town walls and such places. But there is certainly no place for them to spoil the beauty of fine country or to capitalize places of American historic interest."

The New York *Herald-Tribune* declares that "it would be a pleasure to hear of some stretch of country that has succeeded in getting rid of the signs that mar agreeable landscapes. Most of the reports are of extensions of the pest. . . . The leaven of public sentiment is probably working. Judging by the volume of protest, the intrusions are becoming more and more obnoxious to the millions who find recreation in motoring or would like to find it. Where is the sightly region that has definitely got the upper hand of the 'Buy-way' nuisance, as Mr. Pack calls it? Its light should not be hid under a bushel."

The "Leaven of public sentiment is, indeed, working. The organized industry is beginning to make frantic gestures as though about to make a large investment in brooms to clean its own house. However, elsewhere in this issue the problem, as California faces it, is discussed. There have been many gestures in that State but they have been only that. The chief thing which the billboard industry lacks is intelligence, and even sweeping requires some of that.

Furs Without Traps

In a recent editorial the New York *Herald-Tribune,* anent the announcement of the Paris fur styles for the coming winter, avers that it is time again to inquire into the progress that has been made to promote the sale of furs humanely caught. The newspaper points out that some progress has been made with fur farms, enough to demonstrate that it is possible to produce furs on a commercially profitable basis for those who care to wear furs with a clear conscience. The editorial adds that this is small in proportion to the number of furs caught in the steel trap, and quotes the London *Spectator,* which has taken up the cudgels for the humanely obtained fur. This publication has offered a free page advertisement to the firm which is the first to obtain and sell as such humanely killed furs. The intent is laudable but the whole thing has one sad weakness. Humanely caught furs will become the fashion and will be all the rage as soon as fur dealers learn fully their parts. A skunk, for example, goes into the great hopper of the fur trade, is sold and resold; tanned and sold; made up and sold; and finally reaches the consumer. Who can prove whether the animal was trapped, shot, drowned, asphyxiated or died of alcoholism? But any fur-seller with sense, as soon as he realizes that the public demands only humanely-caught furs, will mark his goods accordingly. It is not beyond the bounds of reason that the fur dealers themselves helped to invent this idea. Furs from contented foxes will be the slogan and who can prove them otherwise?

And Nary a Film

The following is reprinted from the Nature Notes of Glacier National Park, both because it is delightfully written and because it means something intimate to at least some readers of Nature Magazine:

"It was late on a sparkling July afternoon. A weary and footsore party had just descended upon Sperry Glacier from the summit of Gunsight Mountain, where an unexpectedly sublime panorama on all sides had taken them by storm. On the summit, they had seen far below, the cobalt blue waters of Lake Ellen Wilson washing the precipitous cliffs of Mount Jackson, four thousand feet high. To the southward, immediately across the broad emerald meadowland bordering the Middle Fork of the Flathead River stretched the rounded summits of the Swan Range, surmounted by snowy GN Peak with the bluish-white ice of GN Glacier reposing against its northern slope; beyond lay imposing masses of the Mission Range with their dominating summit, Mt. McDonald; far on the horizon, 135 miles away, loomed the mountains that border historic Lolo Pass over which the great Chief Joseph led his stalwart Nez Percés on a 1,200-mile pilgrimage to the land of promise and peace in Canada, a pilgrimage doomed to heartrending disappointment, disaster, and death. To the west rolled undulating ridges of forest clad ranges, far into hazy distance. To the east through a gap in the mountains shimmered the blue waters of St. Mary, from whose shores the white man first looked upward on glories of an unborn glacier. Beyond, like a billowy sea, the variegated greens of the Great Plains surged on until blended with the blue of great distance. To the north, the lofty park mountains lay piled in picturesque disorder, glaciers clinging to sheltered cirques and fleecy clouds growing or disappearing as they climbed up the mountains or slid over jagged crests. On reaching the uppermost pinnacle, each uttered exclamations of joy and admiration, each started taking snapshots in every direction. It was all so irresistible, and soon every film in the party had been completely exposed.

"An exhilarating slide of a quarter-mile down a precipitous snow-bank followed, and members were still chuckling over the thrill of dashing speed and flying snow as they scrambled over a low hill of morainal rock on the side of the Glacier—and here, with all suddenness, they confronted an old mountain goat, scarcely twenty feet away, busily licking some rock salt placed there by the glacier guide.

"These people were residents from Boston, New York, and other places east, had travelled two thousand miles to study the fascinating animal life of Glacier Park, and here before them, almost within reach of the hand, was that most interesting of park animals, the mountain goat, and not a single unexposed bit of film left in any of the six cameras of the party. I leave it to you, gentle reader, to visualize dejection, magnified.

"Nor did dejection diminish while the party descended the rocky parapet by the aid of a good steel ladder, and could see the head of the goat as he looked down from behind a ledge, wondering what all of the fuss was about."

This note is signed G. C. R., which means George C. Ruhle, Park Naturalist, of Glacier. And the six dejected mountain climbers were members of Nature Magazine's first Glacier Park party.

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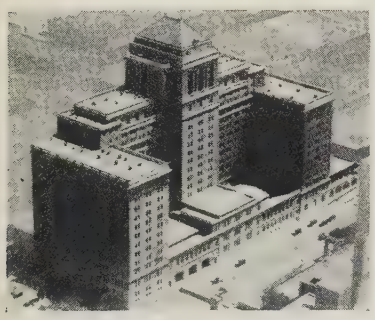

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THE SHENANDOAH COMMUNITY WORKERS

(Continued from page 301)

destiny for each member of the group. And as long as they continue to please children, and grown-ups too, with their Nature products, as long as that newly-achieved joy of working persists, then will prosperity come, slowly perhaps, but surely, to give those stalwart, close-working families the happiness and comfort they have so long toiled for in vain until now.

The Shenandoah Community Workers are always glad to welcome visitors and show them through their interesting workshops. For those desiring overnight accommodations there is a comfortable summer hotel at Orkney Springs, Va., only two miles distant.

Grecian Wild Life

In our reading of ancient days we have frequently come across references to mammals, birds and other forms of wild life which seemed to have no modern counterpart or were not identifiable. It is, of course, true that some forms existing in those days are now extinct. To trace down these lost animals and to identify others for us, Norman Douglas has gone to great pains and transformed his findings into a delightfully written book, *Birds and Beasts of the Greek Anthology*. The title should alarm no one because the handling of the subject is not as formidable as might be supposed. On the contrary, Mr. Douglas, as many know, writes with charm and humor and his present subject permits him ample opportunity. The book is published by Johnathan Cape and Harrison Smith, 139 East 46th St., New York City. It sells for three dollars.

Caring for the Pup

Some time ago Mrs. Josephine Z. Rine contributed a helpful article to Nature Magazine on Bringing up the Puppy. Now this article has been expanded, made more detailed and appears under the title, *Your Puppy, His Care and Training*. In the interests of all puppydom it could be wished that this book, or one similarly good, might be in the hands of all those who undertake to raise a dog. The publishers are the Popular Dogs Publishing Company, 119 So. Nineteenth St., Philadelphia.

Mushrooms, Yum! Yum!

Although *Mushrooms of Field and Wood* by Margaret McKenny is not written for the mushroom lover who views these woods growths from the epicurean point of view, it is, nevertheless, of value to him. Really, however, this book is designed for the individual beginning the study of mushrooms and deals with the more conspicuous forms, setting forth their fascinations of shape and color. It is a well-illustrated, simply descriptive discussion of these mushrooms and a handy introduction and handbook of mycology. It is published by the John Day Company of New York and sells for two dollars.

May We Enroll You as a "Member"

without cost or obligation?

SHENANDOAH Community Workers right now are less eager to secure actual orders for our handicraft (though of course they are very welcome!) than to build up a list of nature-minded people on whose sympathetic interest and backing we may count. To this end the "Membership" idea has been evolved.

Shenandoah Community Workers take this opportunity to acknowledge indebtedness not only to the American Nature Association and Nature Magazine *for generous help, but also to the National Association of Audubon Societies, without whose co-operation our Audubon Jig-Saw Puzzles would not have been possible; also to John Martin of* John Martin's Book—*the* Child's Magazine, *for tireless efforts in our behalf. That such organizations and such men should find our enterprise worthy of their interest is at the same time an obligation and an inspiration.*

Application for Regular Membership in the Shenandoah Community Workers' Association means only that you are interested and would like to receive announcements of our new products as they are introduced from time to time, together with information about other phases of our work. Any reader of Nature Magazine is cordially invited to become a "Regular Member" without cost or obligation of any kind, by application on the form provided below.

"Special" Membership involves only an initial entrance fee of $1 and implies a greater interest. Special Members are entitled to a 10% discount on all of their orders placed directly with the Work Shops: also to have goods sent them for examination on approval. There are no dues or fees after this initial entrance fee. Special Members also are of course kept informed about our progress and interesting new developments.

If our "Story" as told in other columns of this issue of Nature Magazine has aroused your interest, will you not permit us to enroll you as a member in one or the other class? We shall be delighted to have your application on the coupon below or in a separate note.

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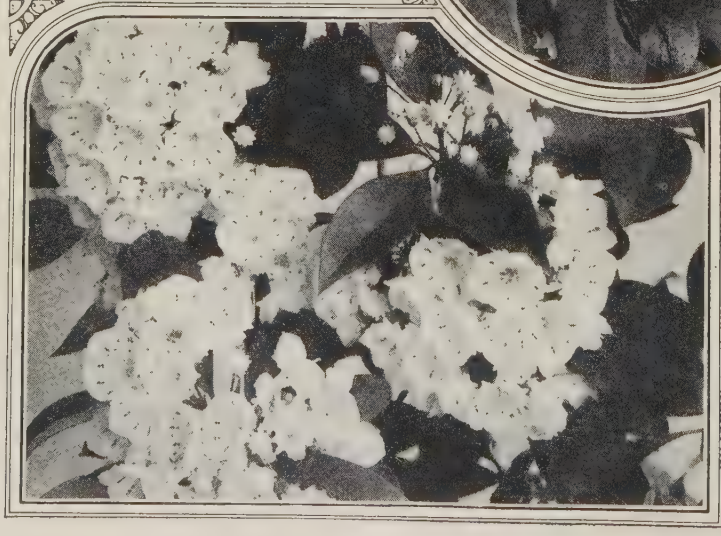
New England's State Flowers

On this page are the official floral emblems of the New England States, of which Rhode Island's Violet, Massachusetts' Mayflower and Connecticut's Laurel are active contestants in the campaign for the National Flower. A report on the progress of the National Flower Vote will be found elsewhere in this issue.

Rhode Island boasts of her Violet

Massachusett's Mayflower dates from Puritan days



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The red clover of Vermont's fields is the State's floral dignitary

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A Rare Relic

"One of the pleasures of Yosemite Museum work," writes C. P. Russell in a recent issue of Yosemite National Park Nature Notes, "is the making of contacts with individuals who have had personal relationships with phases of the human history story told by Museum exhibits. Frequently, throughout the year, museum visitors call upon the park naturalist, who is the director of the museum, to tell him of the thrills they have experienced in discovering mementoes that pertain to their immediate family. Through such contacts the Yosemite Museum has acquired a mass of material bearing upon pioneer affairs in the present park region. Many of the museum possessions have considerable value from the standpoint of the collector of California and a few items are priceless treasures, unique and unreplaceable.

"One such valuable relic came into our possession a few days ago through the thoughtfulness of a San Franciscan, Arthur C. Rosenblatt. It is a print made from the very first photographic negative to be exposed in Yosemite valley. Students of Yosemite history have long known that the pioneer, J. M. Hutchings, had credited one C. L. Weed with taking the first Yosemite picture. In Hutchings' book "In the Heart of the Sierras," he makes mention of his presence in the oldest of Yosemite hotels soon after its formal opening 1859. Hutchings states that at that time he witnessed Mr. Weed take a picture of this hotel. He has reproduced a drawing made from this picture.

"In spite of serious attempts to procure more information on this photographer of 1859 nothing has come to light. It was then a real thrill to find ourselves in possession of an original print made from this very early negative. That the print is genuine seems to be a fact. Its donor, Mr. Rosenblatt, as a small boy resided within a few blocks of the Hutchings' San Francisco home on Pine Street. Mr. Rosenblatt and his brother played with the Hutchings' children. In 1880 the Hutchings' home was destroyed by fire. The small boys of the neighborhood searched the debris for objects worth saving, and Irving and Wallace Rosenblatt salvaged a pack of large water-stained photographs. Arthur Rosenblatt with forethought mounted these pictures in an old scrap book. He has cherished them through the years that have passed. In June of 1929 he visited the Yosemite Museum and was interested in the historical exhibits. In his study of the displayed material he came upon a photographic copy of the old drawing of the 'Hutchings' house' which had been taken from 'In the Heart of the Sierras.' He recognized it as identical with one of the old photographs which he had preserved since 1880. He made his find known to the park naturalist, and immediately phoned to his San Francisco home and requested that the old scrap book be mailed at once to the Yosemite Museum. Upon its receipt the old hotel photograph was segregated from the others and comparisons were made with the drawing in the old Hutchings book and with the building itself which still stands. There is no doubt that the print is from the original Weed negative."

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Sweden Protects Mammals

Although at one time threatened with extinction, the European bison, or buffalo, has responded to protection afforded it at Engelsberg in the province of Västmanland, Sweden, and that country now has the largest stock of this species in the world. Similar work has been carried on with the beaver, with the result that eight years of protection are now resulting in thriving beaver colonies. Importations of the German hare and pheasants with subsequent prohibition of shooting has been successful also. The moose is protected from hunting the year around except for a brief two weeks and the bear enjoys a similar protection. Swedish public opinion is said to be firmly behind strict restriction of shooting and the protection of wild life.

Florida Bird Haven

By executive order, President Hoover has set aside four keys in the island group known as Cedar Keys off the west coast of Levy County, Florida, as a refuge and breeding ground for birds. Hundreds of aquatic birds nest and winter on these keys. The refuge will be administered by the Bureau of Biological Survey.

The Almighty Dollar

While *Money* can hardly be called a Nature book, its author, Mr. Samuel Crowther, recognizes that it is human nature to want at least enough money. The book is subtitled "How to Make It, Invest It and Use It." We doubt very much whether it would make us all rich but it is interesting in the ground of finance which it simply and clearly covers. The publishers are the Stratford Company, 289 Congress St., Boston.

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For Butterfly Hunters

Professor E. Dussauze of l'Ecole Alsacienne, 109 rue Notre Dame des Champs, Paris, has recently concluded a successful Nature visit to this country. In connection with the trip he has collected butterflies and devised a novel method of compactly and safely packing them which, he writes, he wishes to pass on to the readers of Nature Magazine, since the magazine has been of such interest and help to him.

"Cellophane," M. Dussauze writes, "has been the means. Take a strip of it a little longer than the butterfly's body and one-quarter of an inch wide. Glue the body, with the legs folded under it, to the strip, using as little glue as possible but enough to keep the legs folded fast against the body. When dry put the butterfly on the ordinary stretcher with the body in the slit. The cellophane strip will lie on the bottom of the slit and can be pinned down for safety. Then stretch the wings with paper and pins as usual, being sure to keep the antennae down on a level with the wings, and wait the usual two or three days for muscles and body juice to dry.

"Now comes the wonderful use of cellophane. Take out all the pins and handle the butterfly by the cellophane strip. Place it carefully in a square cellophane envelope which should consist of a double square of the substance folded over into one square and overreaching the wing extremities by a quarter of an inch. Glue down the three unconnected edges with a thin line of glue and you have the butterfly ready for showing or for packing."

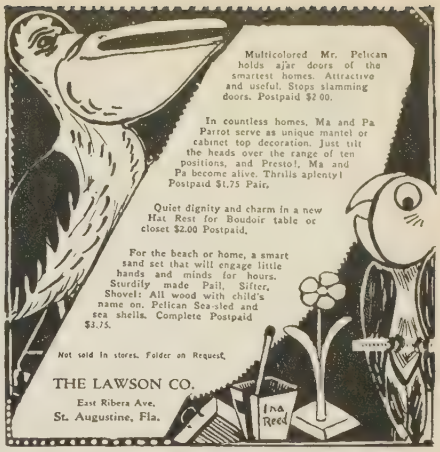
M. Dussauze points out that this method places both sides of the butterfly in view for examination, is marvelously compact and safe from mites, parasites and the like. He says that he would be pleased to hear from any collectors who employ this device, both as to their success and any possible improvements which may occur to them.

Exotic Bird Pictures

We note with interest that *Aviculture*, the organ of the Avicultural Society of America, in its July issue publishes a colored frontispiece of six of the parrot family. We frequently receive inquiries for colored pictures of exotic birds which apparently have not been given the attention of bird artists one might expect. Since this Society is primarily interested in these birds and their care we may be able to fall back upon it to supply a frequently expressed need.

More Loco Weeds

Since its first publication ten years ago of a bulletin on loco weed and the disease it brings to live stock, the U. S. Department of Agriculture has continued its investigations of this plant. The results of this decade of study have been embodied in a new publication,—Farmer's Bulletin, 1054-F,—available free from the Department. It lists new varieties of the weed and other related plants with poisonous character.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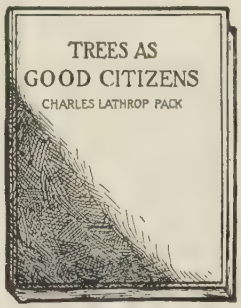

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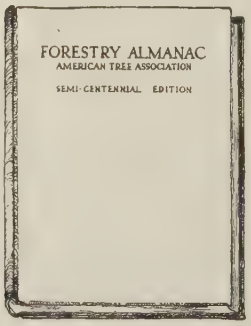

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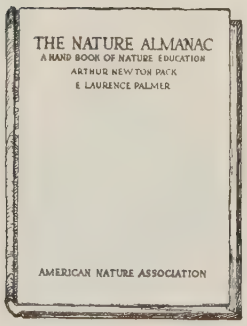

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More and More

Figures compiled from the various states and Alaska indicate a marked increase in the numbers of hunters, judging from the hunter's licenses issued. During the season 1926-27 licenses issued totalled 5,987,505 and increased to 6,450,000 for the 1927-28 season. It is obvious that those interested in preserving various forms of our wild life for posterity have distinct reason for alarm if any such ratio as this is maintained.

Fate of Crippled Ducks

Soon the wild fowl shooters will be indulging in their sport on numberless waters throughout our broad land. We can not think that the duck hunters of California are more reckless in their waste of bird life, or more indifferent to the suffering of their quarry, or poorer shots, or less mindful of the ethics of true sportsmanship, than are their brethren in other states. But from the testimony of some in their own ranks, we learn that the sport of duck-shooting in that state is accompanied by an amount of suffering and waste of bird life that should disgust anyone with a shadow of feeling for our beautiful and harmless wild fowl. From accounts in the public press we learn that on the properties of some clubs it is forbidden to pursue and pick up crippled ducks during the hours of shooting, since this would alarm the flying birds, and cut into the sport of the neighboring shooters. In some cases keepers are sent out, after the shooting has ceased, for the purpose of retrieving the crippled birds, and those recovered are divided among the members. In one instance, cited by a shooter apparently less brutal than his brother sportsmen whose rulings dictate this practice, a hundred crippled birds thus recovered, a by-product of shooting that has netted 16 men their limits of 25 ducks each, were divided among four of the members, thus giving them a double bag. As indicative of the magnitude of this problem we may quote the figures published by one sportsman that show individual bags of 7 ducks killed to 30 wounded, and 17 killed to 17 wounded, and who concludes that the ducks killed about equal the number crippled.

Anyone even slightly familiar with the habits of wounded birds, whose instinct teaches them to hide from pursuers, knows how difficult it is to retrieve these crippled ducks after they become scattered, and one is therefore led to the belief that many are never recovered. This belief is proven a certainty by the testimony of an eye-witness, whose search for wounded birds took him to a small island where the stench of the decaying bodies of ducks that had finally crawled out of the marsh to die was, to use his own word, terrific.

But why continue? It must be obvious that the practice of wild-fowl shooting may sometimes fail to create in its devotees those sterling manly qualities that are supposed to be the most valuable products of the sport. Is it any wonder that the better class of sportsmen join in the demands of disinterested friends of the vanishing birds that sport be purged of some of its horrors by the imposition of more drastic restrictions?

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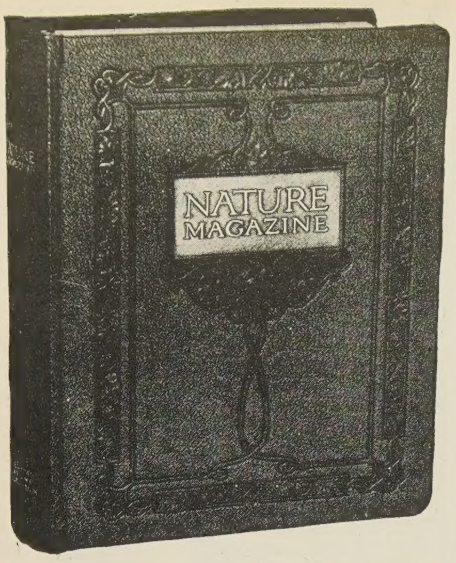

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MRS. COOLIDGE PLANTS ANOTHER TREE

In Front of Town Hall She Helps Mark 150th Anniversary of Hancock, N. H.

LONG a member of the tree planting army, Mrs. Calvin Coolidge by planting a tree at Hancock, N. H., has again set a good example. This time the tree, a maple, was placed on the common in front of the town hall during the celebration of the 150th anniversary of the town. Her first tree planting registered on the national honor roll of the American Tree Association at Washington, was that of the Oberlin College Elm placed on the grounds of the Lincoln Memorial when she lived in the White House. Mrs. Coolidge planted a second tree on one of the playgrounds in Washington. At Hancock a tree also was planted by Gov. Charles W. Tobey and a certificate of membership has been sent the Governor by Charles Lathrop Pack, president of the American Tree Association.

In Michigan is found another fine example for organizations to follow. The Huron National Forest was the objective of hundreds of Michigan Kiwanians when the dedicatory exercises coincident with the second annual planting of 5,000 acres in the Kiwanis Forest took place. James W. Davis, Secretary of Labor; Associate Forester Sherman and Congressman Roy O. Woodruff represented the national government, while Gov. Fred W. Green, E. L. Hyer, Michigan Conservation Department, and Marcus Schaaf, state forester, represented Michigan. Last year the Kiwanis Forest planting of 5,577 acres was proclaimed the greatest co-operative forestry planting in the history of the country. Michigan Kiwanians' contribution to the reforestation project in Michigan during the past two years will have cost them approximately $20,000.

The Men's Club of St. John's Church at Delhi, N. Y., has taken a forward step whose ultimate effect can only be estimated. The club voted to take part in the State's reforestation policy and accepted an acre of land offered by Robert Moody. On this, deeded to St. John's Church, the club planted 1,200 trees given by the State of New York. Commercial returns from such plantings are available within 40 years—and in the meantime the church, through its Men's Club, becomes a pioneer in Delaware County reforestation. Upon the club's invitation Congressman Clarke will give an address upon reforestation.

At Camp Lou Henry Hoover, Morristown, N. J., a circle of cedar trees has been planted in the center of the camp field and the registration has been made by Florence Turnbull of Waterbury, Conn.

The 4-H Club girls of Muscatine County, Iowa, claim the honor of the first organized year's program of forestry work among 4-H clubs in Iowa. It is an outgrowth of forestry studies carried on during the girls' regular summer camp for the past three or four years. Some studies in tree identification, outdoor work and tree planting have been carried on in these brief schools in camp. This year the girls decided they wanted to learn more about trees and forestry and so they have adopted forestry as one of their projects. Planting of more trees is one of the specific objectives. To have at least 200 trees planted by club members is one of the goals. This part of the program was initiated with a dedicatory tree planting at the fair grounds at West Liberty. The girls, their leaders, mothers and dads gathered for a day's picnic. After brief Arbor Day exercises, a young sugar maple was planted at the entrance to the fair grounds and dedicated to the 4-H Club girls of Muscatine County. Sugar maple was selected for this planting by a vote of the girls in the various clubs over the county. Miss Lucie Anderson, the county club president, then started the planting. She was followed by each of the individual club presidents and they in turn by the club leaders. One of the qualifications to "make the Summer camp" is to know five trees and the uses of their wood.

Memorial tree planting is going on everywhere and the American Tree Association will be glad to send tree planting instruction, a tree day program and an application blank to all tree day chairmen. As an example of memory trees is the dedication of fifteen trees honoring the memory of past presidents of the Dallas Federation of Women's Clubs at Woodrow Wilson High School across from Federation Grove, Randall Park. The history of the federation from 1896, when it was organized under Mrs. Henry Exall, first president, was reflected in talks made. Mrs. O. L. McKnight, the president, opened the program. The trees were provided by the park board and designated with markers furnished by the federation.

In New Hampshire half of the farm is in woods and the task is to manage the woodlot so that it gives a perpetual and profitable lumber crop. Every county in the State has an active forestry club. Each boy or girl member takes a small piece of woods and manages it, cutting out the weed trees and trees of lesser value, leaving only sound trees with room to grow. Each protects his woodlot from fire, cattle and tree diseases and in between times learns to distinguish the native trees and measure them, and has a good time doing it. Vermont has a lively girl foresters' club called the K. Y. T.—Know Your Trees Club.

Every New York boy who joins a forestry club agrees to plant 1,000 trees on his father's farm or any suitable land he can secure, and to protect them during the first year. The seedlings are given to the boys by the New York State Conservation Department.

The Pioneer Forestry Clubs of Harrison County, Ohio, did seed gathering for the State nurseries. They collected twenty-six bushels of black walnut, and ten bushels of tulip seeds. These clubs planted 103,500 seedlings on Ohio farms and vacant lots.

To be eligible to join a club in Tennessee a boy must gather a peck of black locust seeds in the hull. These he dries and stores, to be planted later under the direction of the county agricultural agent.

The Junior Forest Rangers of Wisconsin, whose emblem is the pine tree, are specializing in woodcraft.

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The Inkograph fully justifies all claims you make. I own a Waterman but Inkograph is far preferable. Frank R. Sargent, Oakland, Calif.

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Oh, boy, I am tickled skinny to have the Inkograph, it's a darling. I can now make carbon copies in taking orders and send originals in ink to factory instead of a pencilled sheet. It surely flows over the paper as if it was grease instead of ink. No trouble at all and a thing I could not do before to trace straight lines very fine and clean. No smear, no muss of any kind. It's just great. E. A. Simms, Jersey City, N. J.

My Inkograph is the smoothest writing instrument with which I have ever written. That is saying a lot. I am a teacher by profession. I have a $7.00 pen and another that cost more than the Inkograph, but Inkograph is better than either. It is the greatest improvement in writing instruments since the Babylonians recorded their thoughts on clay tablets with a triangular pointed reed. John R. Atwell, Chadwick, N. C.

My Inkograph is the first and only writing utensil I ever owned that I can use with pleasure. To be without it for any time would upset my business day. It has always worked perfectly. I have never had any difficulty with it. Arthur L. Fox, Centerville, Mich.

I am a bank teller, have used all kinds of fountain pens, but can honestly say for my work I never found a pen so easy and tireless to write. You can pick it up any time in any position and write immediately and all numbers and words will be the same. Try and do it with any other pen. My buddies all agree that it is best for our work. C. R. Morley, Allentown, Pa.

Delighted. It writes bully—you have invented a pen that is perfection. It is so much more rapid than my $9.00 fountain pen. I wish you abundant success. S. L. Carlton, Aurora, Ill.

I am very well pleased with my Inkograph. It is just what I have been looking for. I have had several ink pencils but nothing like the Inkograph; it writes like the point was greased and it makes no difference what kind of paper, it is fine for shipping tags. S. I. Jarrett, Harrisville, W. Va.

The Inkograph, I am thoroughly convinced, is the best writing instrument I have ever used. It is sure, sane and clean and always ready to use. I am very well pleased with it. J. E. Rampton, Pensacola, Fla.

Your Inkograph is everything you state. It is just wonderful. So send me two more. Arthur Olcott. Tucker, La.

ANSWERS the purpose of pen and pencil combined!
Actually improves your hand writing!
Writes freely and easily without miss, skip or blur!
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Writes equally well on rough o smooth paper!
Wonderful for making carbo copies with original in ink!
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of both pen and pencil, minus the weak points of both, plus improvements not found in either.

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Made of finest quality, highly polished, black fountain pen material, with 14-Kt. solid gold point and feed, safety screw cap, self-filling lever and clip. In workmanship, quality and appearance it is the equal of pens selling for a great deal more.

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Not the tiniest drop of ink will spill, although one filling is sufficient to write thousands of words.

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prevents clogging. No complicated mechanism to clean or get out of order.

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That hard smooth ball-like 14 kt. gold point which makes possible writing in ink, over the coarsest paper, as rapidly as with softest lead pencil.

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